

Federal

Telephone & Telegraph Co.

MANUFACTURERS

TELEPHONE, TELEGRAPH AND RADIO APPARATUS AND ACCESSORIES

FACTORY AND HOME OFFICE

Buffalo, New York, U. S. A.

BULLETIN No. 119-W

OCTOBER 1922

THE LONG DISTANCE RADIO BROADCAST RECEIVER



FEDERAL TYPE 57

FEDERAL ACCESSORIES ARE THE RECOGNIZED STANDARDS

Foreword

In presenting the new line of radio frequency amplifying equipment to the Radio Public, the

Federal Telephone & Telegraph Company offers the results of much careful, painstaking research and development work. The difficulties of the design and manufacture of useful radio frequency amplifying equipment are many and are such that only by the most intense kind of research and through the most careful attention to the minutest details in design and manufacture has it been possible to make available the radio frequency amplifying equipment described in this bulletin.

This apparatus, like all **Federal** products, typifies all that is finest in the details of design, in the materials and workmanship of manufacture and in the ease and reliability of operation.

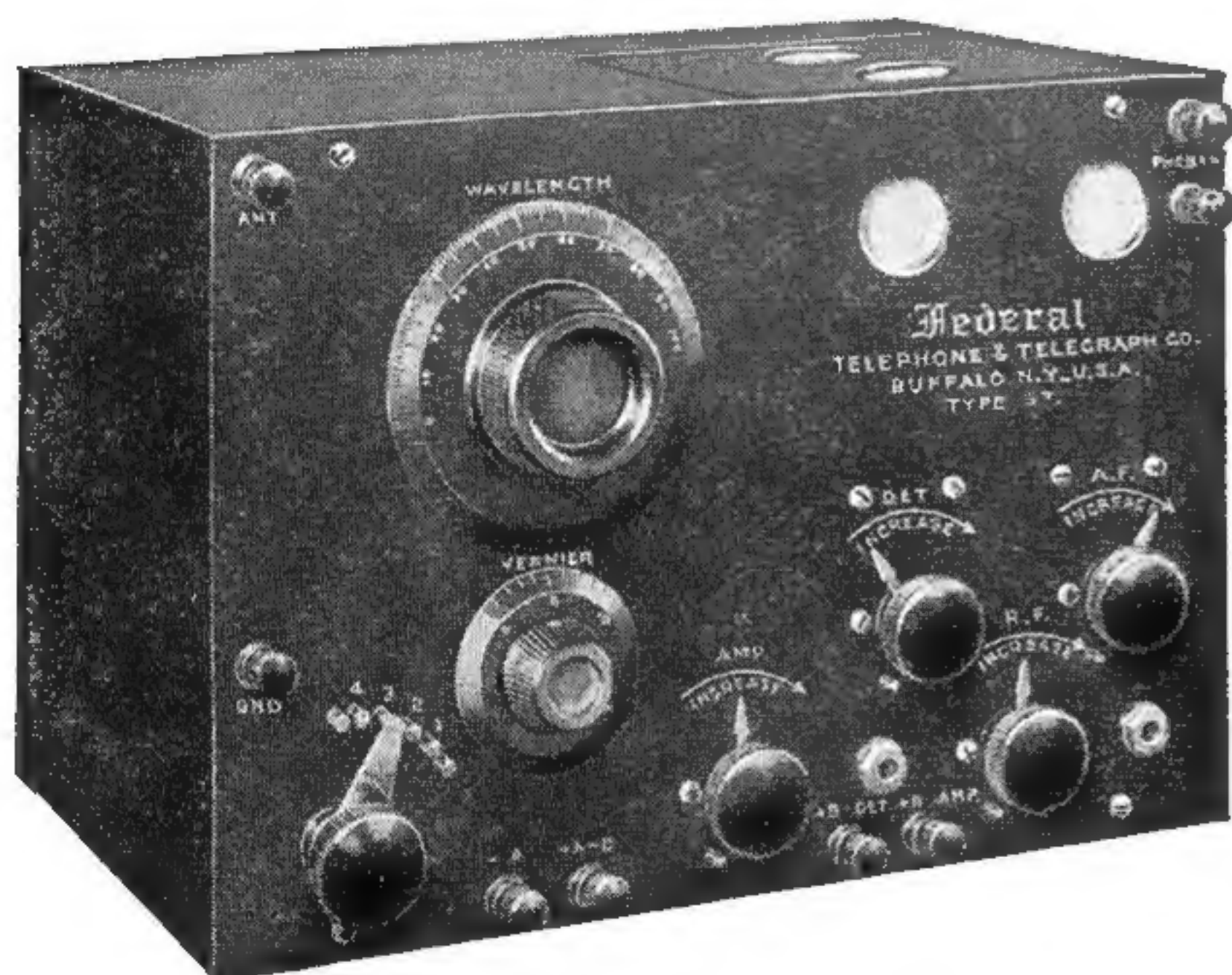
Posted May 2021
By Brian D. Szafranski
Elma NY USA

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for commercial profit.

FEDERAL No. 57 RECEIVER

The FEDERAL No. 57 Receiver makes available to the novice all that is newest and best in radio receiving equipment for the reception of broadcast radio signals. It combines with its simplicity and reliability of operation, a sensitiveness that is unrivaled by any receiving equipment that has yet been built for use by the broadcast listener. It is not only the most sensitive receiver for concert use that has yet been devised but it gives its extraordinarily high degree of amplification with the same pureness of tone and beauty of reproduction that has characterized the simpler and less sensitive types of FEDERAL receiving equipment. Its extreme sensitiveness makes it especially valuable for use with small outdoor antennas, or for reception where a good outdoor antenna is not available and use must be made of indoor or other type of restricted antenna.

The exceptionally simple operation is secured thru the use of careful design of its tuning system and thru the use of radio frequency amplification, in addition to its two stages of audio frequency amplification, all of which are integral parts of the receiver.



No. 57 Receiver

It consists essentially of a tuning system and a vacuum tube amplifier of unique design. The tuning system is so proportioned as to allow of broadcast reception when used with a wide variety of antennas. It will serve for such reception not only with large antennas commonly used for this purpose but may be used where available space or other limitations make small and ordinarily insignificant antennas necessary.

Thru the use of the extraordinary sensitive amplifier which is an integral part of the receiving set, it will make possible the reception of signals over distances that are utterly inaccessible when use is made of types of equipment other than those including radio frequency amplification.

The tuning system is of the single tuned circuit type, crude adjustment of the wave length being accomplished by means of a single large control knob while extremely minute adjustment of wave length is secured thru the use of an exceedingly sensitive vernier control. Provision is made thru a conveniently located switch for the adjustment of the receiver to suit a wide variety of antennas and when this adjustment is once made, it requires little further attention.

The amplifier includes one stage of radio frequency amplification, a detector tube and two stages of A. F. amplification. The radio frequency amplification is accomplished by means of the FEDERAL No. 30 transformer which is supplied as an integral part of the receiver and is especially designed to give maximum possible amplification throughout the wave length of the receiver. The audio frequency transformers are the standard FEDERAL No. 226-W transformers, and all other parts such as tube sockets, rheostats, etc., are standard, high quality, FEDERAL products. The entire amplifier is controlled by three filament rheostats which allow of the separate control and careful adjustment of the separate tube filaments.

An amplification control is provided whereby the amplification may be varied very widely for reception on any wave length or in connection with any antenna with which the set may be used and is particularly useful in short distance reception, for limiting the degree of amplification of signals that are too loud for comfortable reception, and when long distance reception is desired, its adjustment for maximum amplification makes possible reception over ranges that are almost unbelievably great.

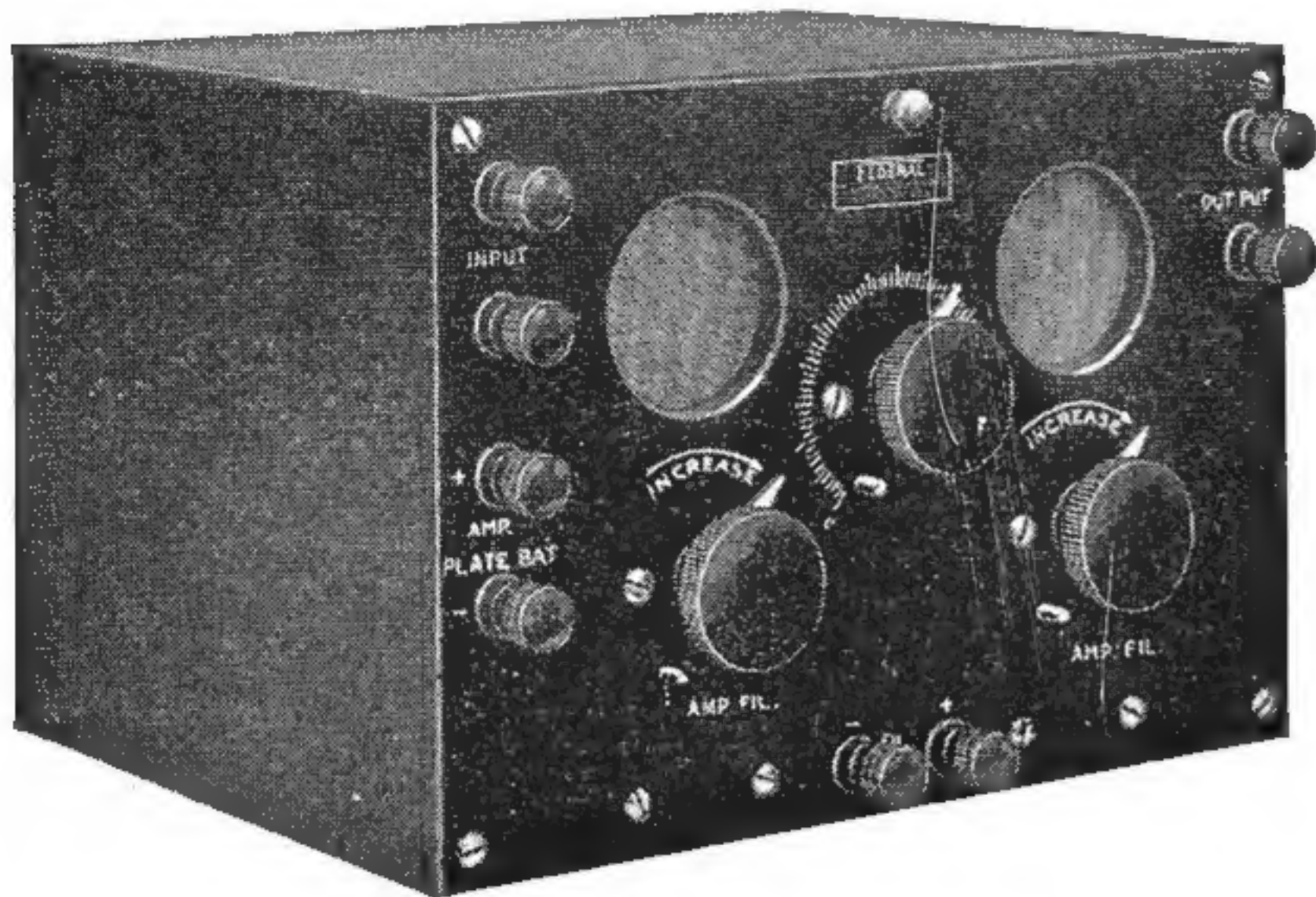
No. 57 Receiver (without tubes, batteries or telephones)..... \$98.00 each

FEDERAL R. F. AMPLIFYING UNITS

The No. 55 and No. 56 FEDERAL Radio Frequency Amplifier Units are of the same high quality of material and workmanship as their companion units, the commonly used Audio Frequency Amplifier Units No. 8 and No. 9. They may be used with any of the FEDERAL Radio Frequency Amplifying Transformers and when used with these transformers they are capable of a degree of amplification far in excess of any other type of device that has ever been built.

The No. 56 Unit consists of one stage of Radio Frequency Amplification and one vacuum tube detector while the No. 55 unit consists of two stages of Radio Frequency Amplification.

The standard No. 40 FEDERAL Radio Frequency Amplifying Transformer Mounting is included in both these units and makes possible the insertion of any of the FEDERAL Radio Frequency Amplifying Transformers into the circuit. Such parts as tube sockets, rheostats, jacks, grid condensers, grid leaks are standard FEDERAL products and combine to make a unit of utmost efficiency and reliability. By the interchangeability of the radio frequency transformers these units may be used for radio frequency amplification at any wave length and through the use of the No. 40 Radio Frequency Amplifying Transformer Mounting the change in transformers can be made in a few seconds.



No. 55 Two Stage R. F. Amplifier

of R. F. amplification, detector and one stage A. F. amplification is particularly well suited for use with small outdoor antennas or indoor antennas. Because of the high degree of amplification resulting from this combination it may be used with antenna systems that would ordinarily be much too small for the reception of any but local signals and with the No. 55 and No. 8 and such small antenna long distance reception can quite easily be accomplished.

Where the user is forced by lack of space or other considerations to use the electric light wires or telephone wires these two units will serve admirably to replace by its extraordinary degree of amplification what is lost by the insufficiency of antenna size.

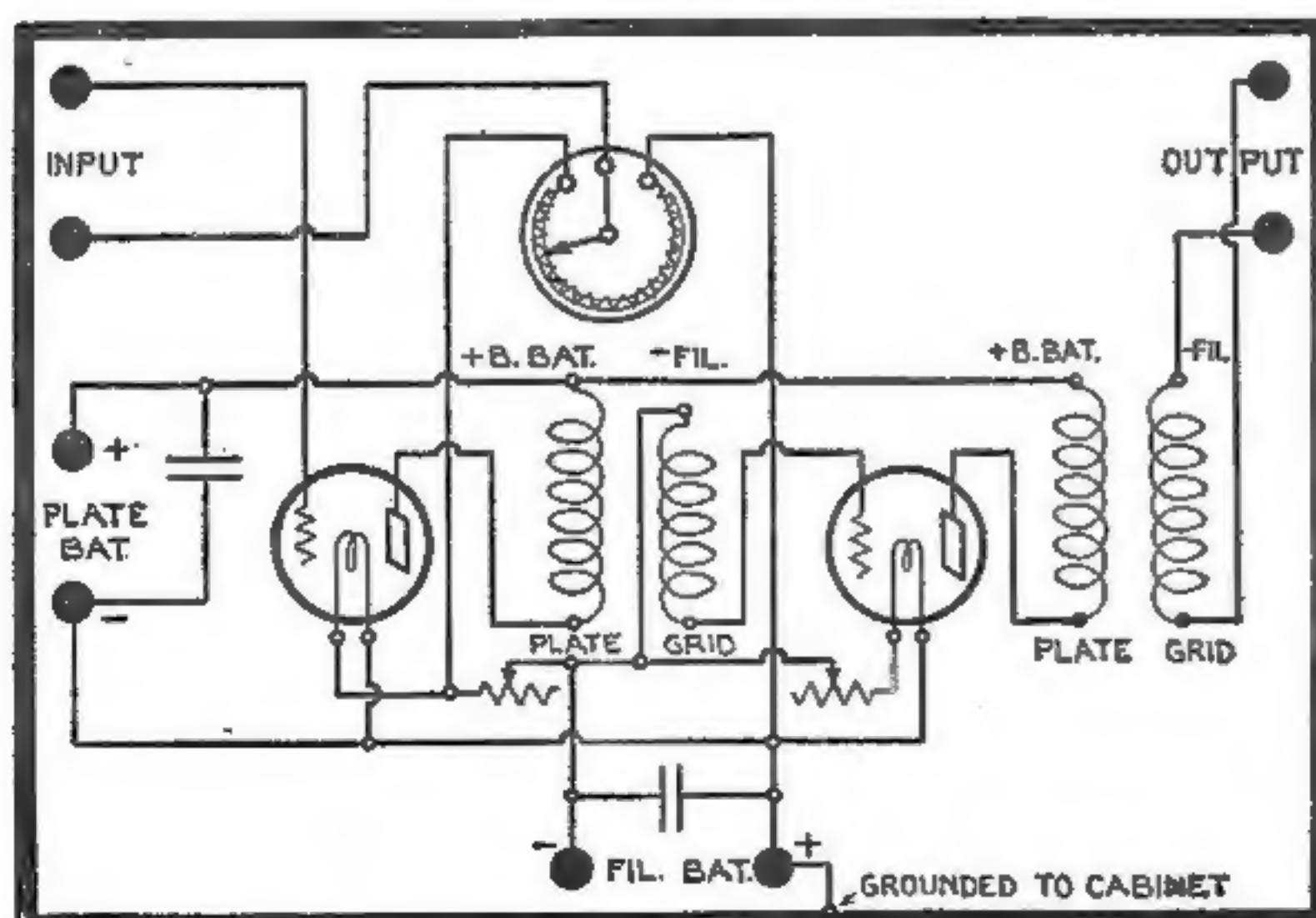
The No. 55 and No. 56 units constituting three stages of R. F. amplification and detector are especially recommended for use with very small antennas or loop antenna where exceptionally long distance reception is to be done and where head telephones are used while No. 55, No. 56 and No. 9, constituting three stages of R. F. amplification, detector and two stages of A. F. amplification when used with a loop antenna serves to make possible reception over the greatest possible distances and allows of the use of a loud speaker instead of head phones. This latter combination constitutes what is undoubtedly the most sensitive combination that can be used for radio reception and it makes quite unnecessary the use of antenna or head sets.

The arrangement of terminals on these devices is such that when used together terminals that require connection are adjacent to one another, thus making proper connection most easily possible.



No. 56 One Stage R. F. Detector

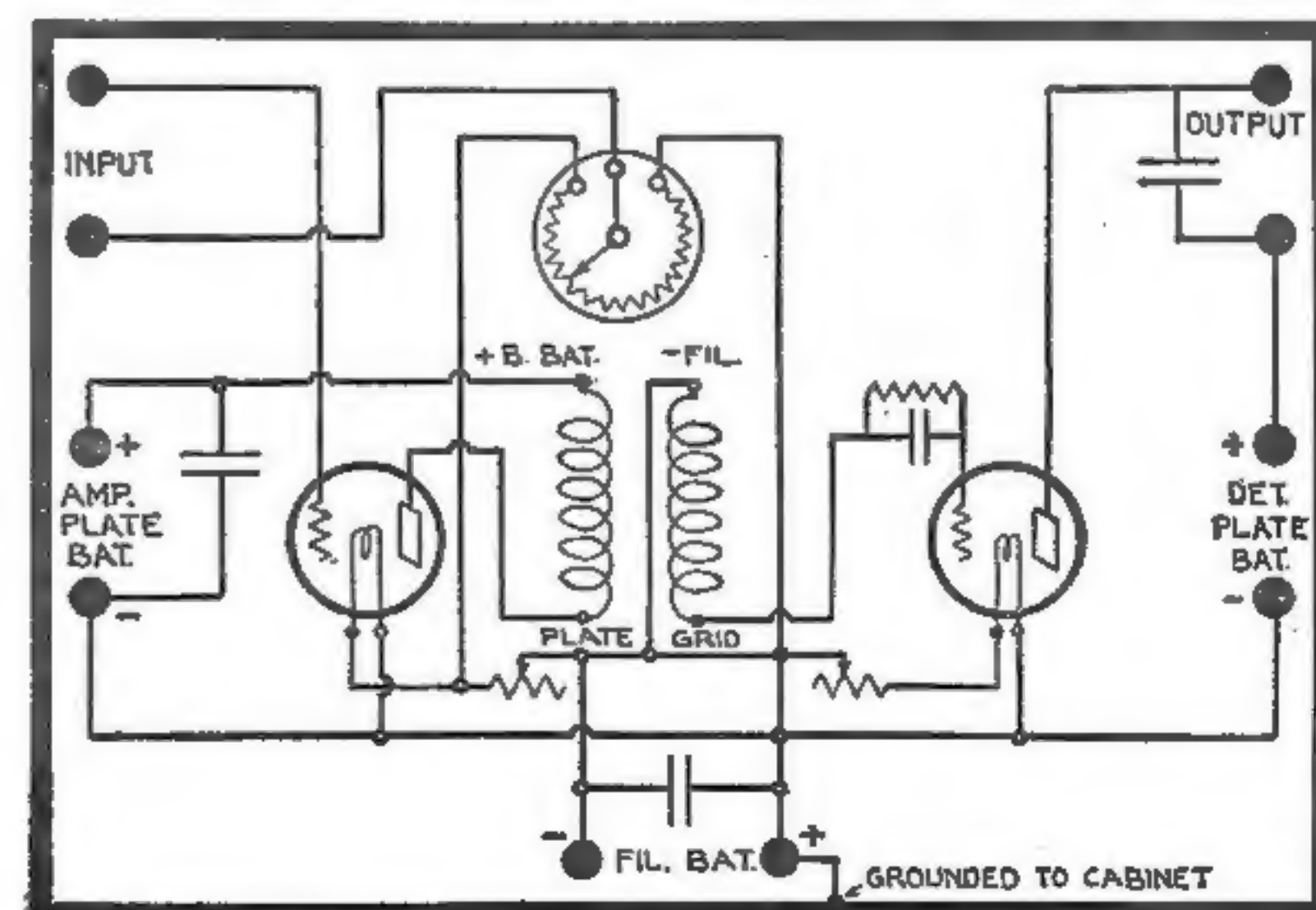
SCHEMATIC OF TWO-STAGE R.F. AMPLIFIER



Unless otherwise specified No. 30 R. F. Transformer is supplied with above units.

Each
No. 55 TWO STEP AMPLIFIER\$58.00
 (Without tubes, batteries or telephones)
No. 56 ONE STEP AMPLIFIER AND DETECTOR 52.00
 (Without tubes, batteries or telephones)
EXTRA TRANSFORMERS
No. 29 R. F. TRANSFORMER 5.50
 Wavelength range 175-300
No. 31 R. F. TRANSFORMER 5.70
 Wavelength range 500-1000

SCHEMATIC OF R.F. AMPLIFIER-DETECTOR UNIT



FEDERAL A. F. AMPLIFYING UNITS



No. 9 Two Stage Amplifier

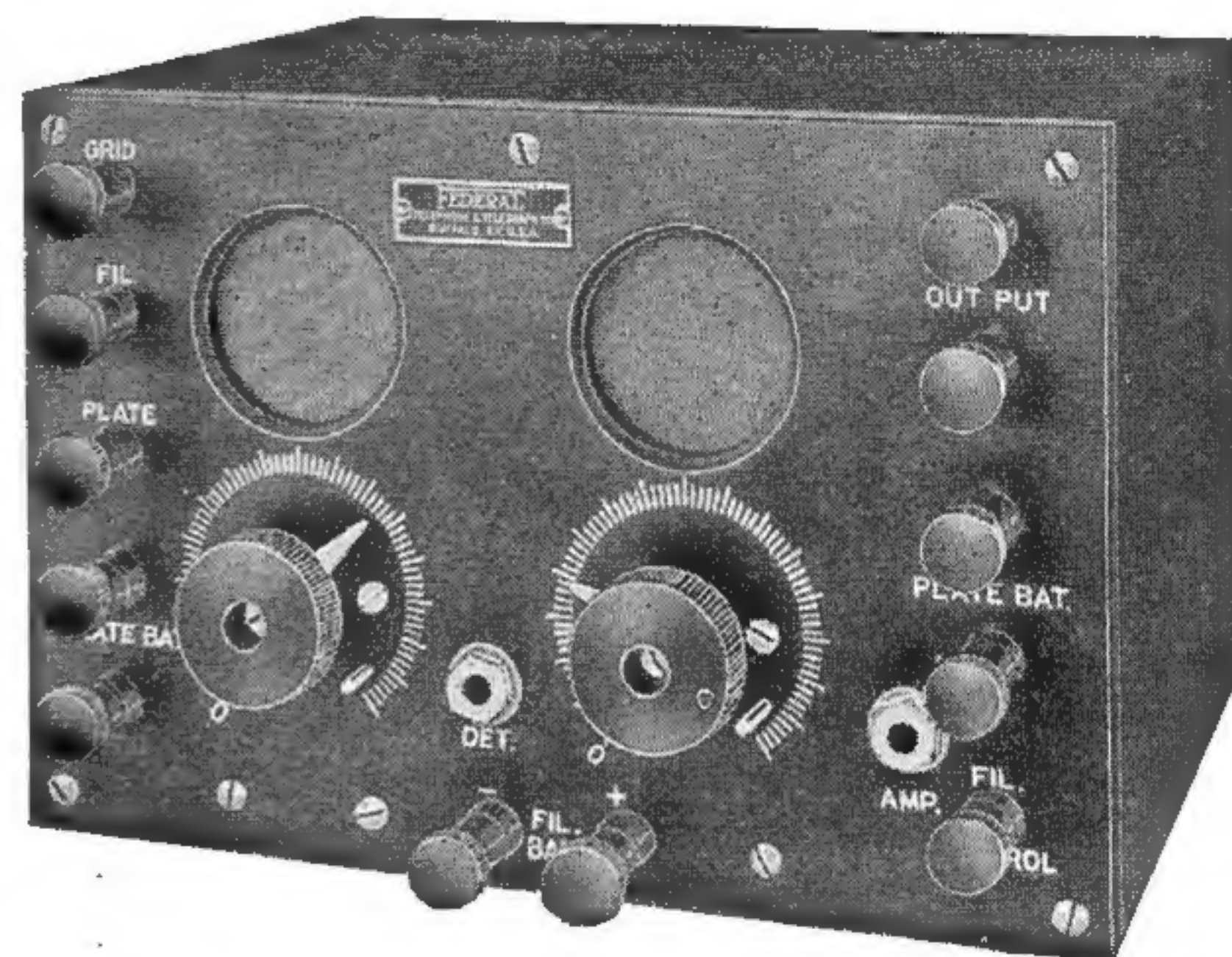
successive stages, tending to produce "howling" and other objectionable noises, are entirely eliminated.

The Federal Automatic Filament Control Jacks provide a convenient and rapid means for shifting the telephones from one stage to another. They are so connected as to cause the insertion of the telephone plug in any stage to light only the filaments required by that stage of amplification.

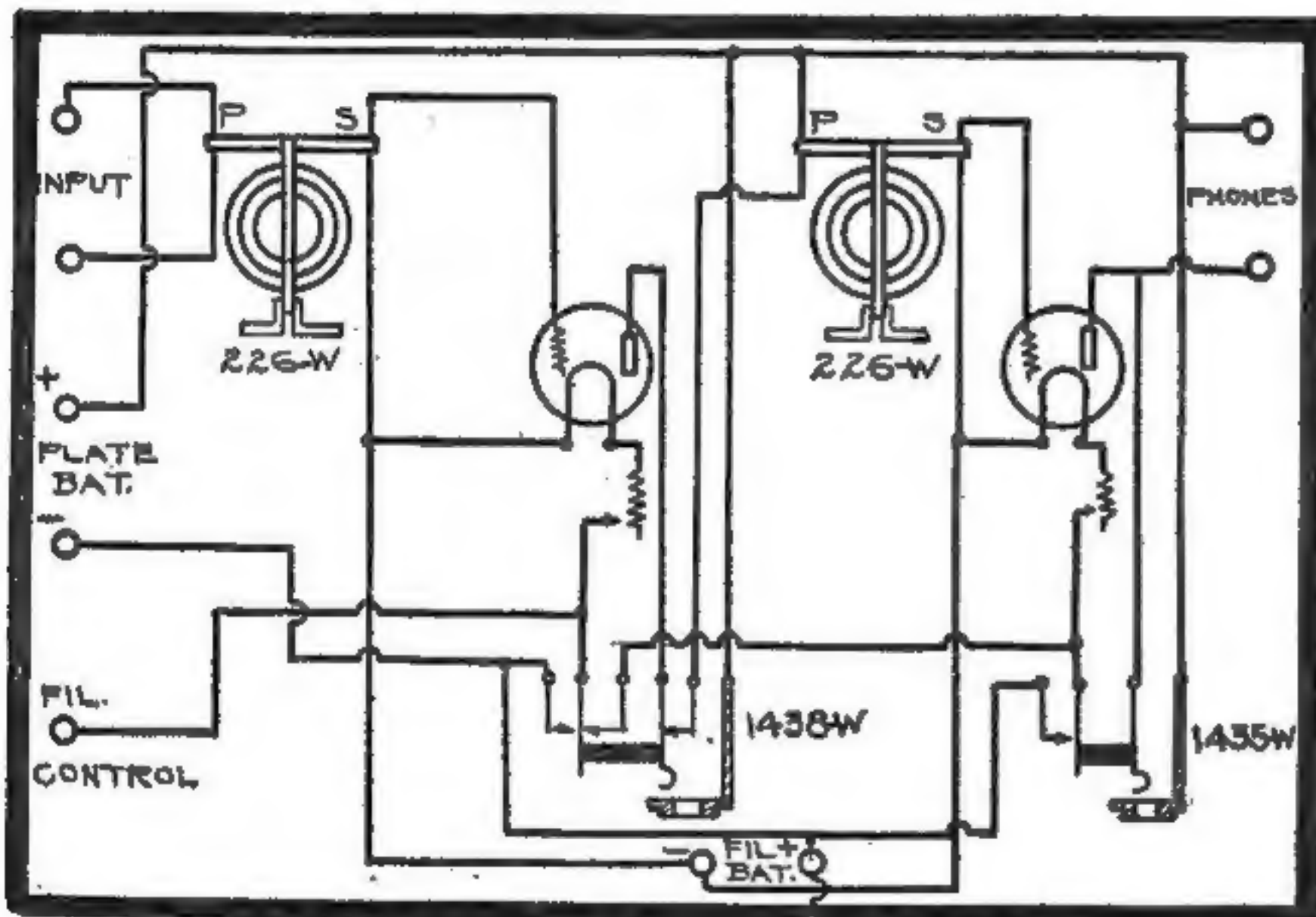
All materials are carefully selected and each unit is thoroughly tested by experts before leaving the factory.

No. 8 Detector and One Stage Amplifier.....\$52.00 each
(without tubes or batteries)

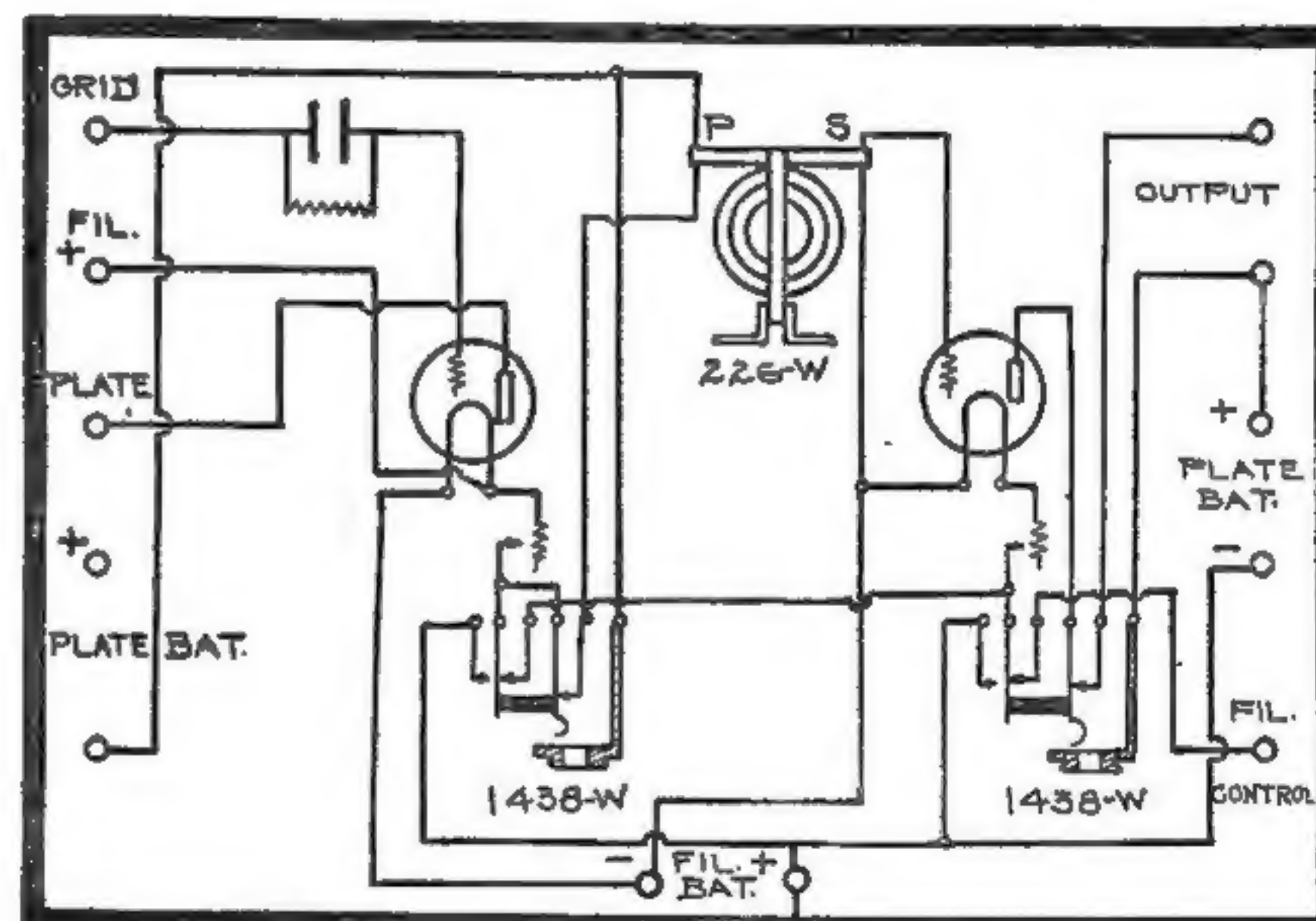
No. 9 Two Stage Amplifier\$58.00 each
(without tubes or batteries)



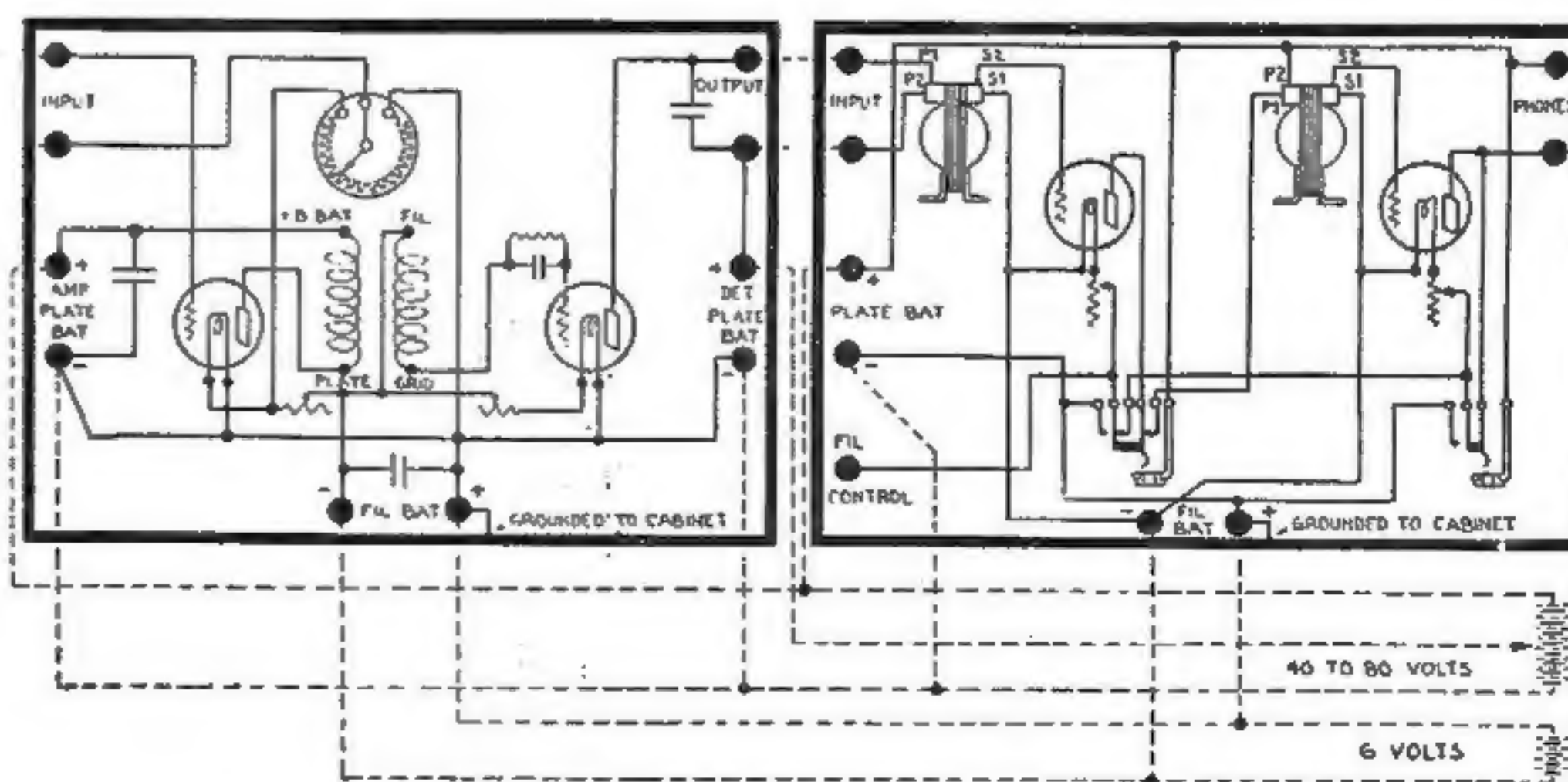
No. 8 Detector and One Stage Amplifier



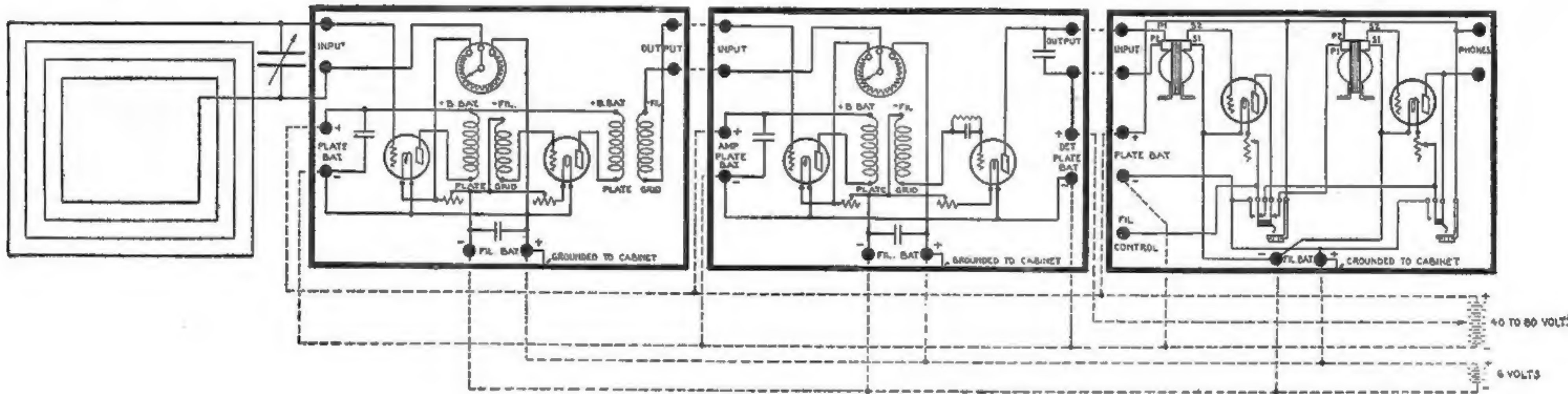
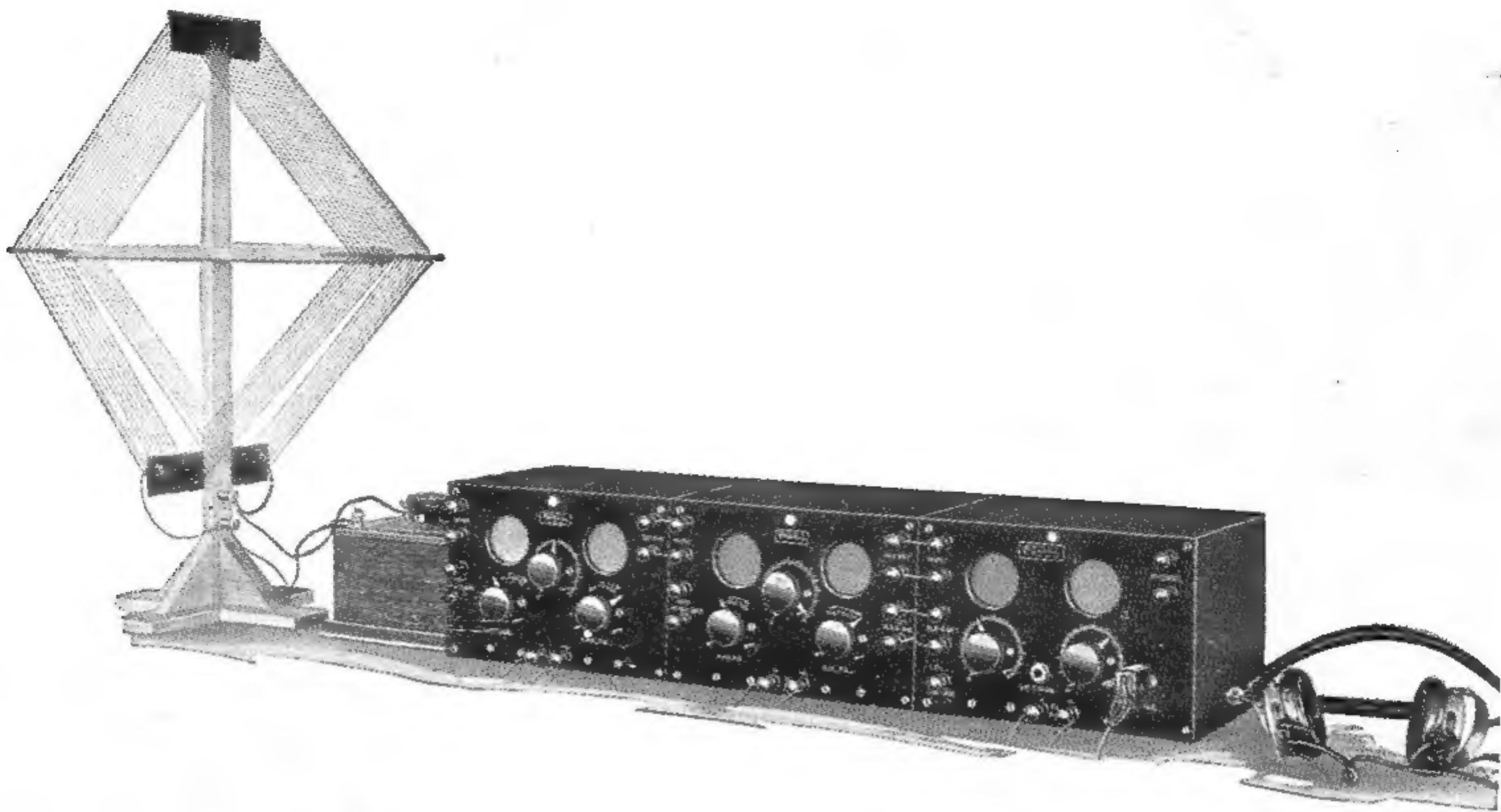
GROUNDED ON CABINET



GROUNDED ON CABINET

1 STAGE R.F. AMPLIFICATION-DETECTOR-2 STAGES A.F. AMPLIFICATION
2 TUNED CIRCUIT RECEIVER40 TO 80 VOLTS
6 VOLTS

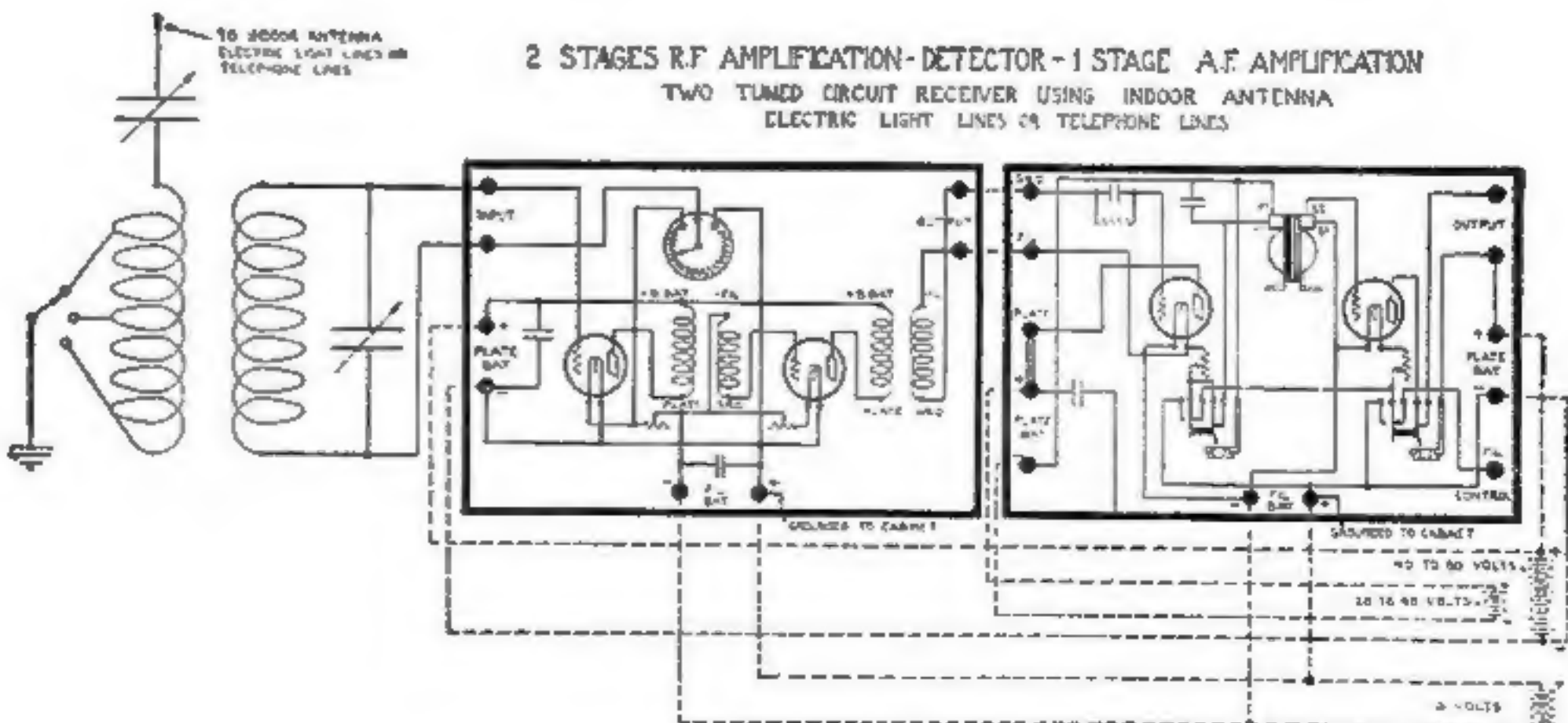
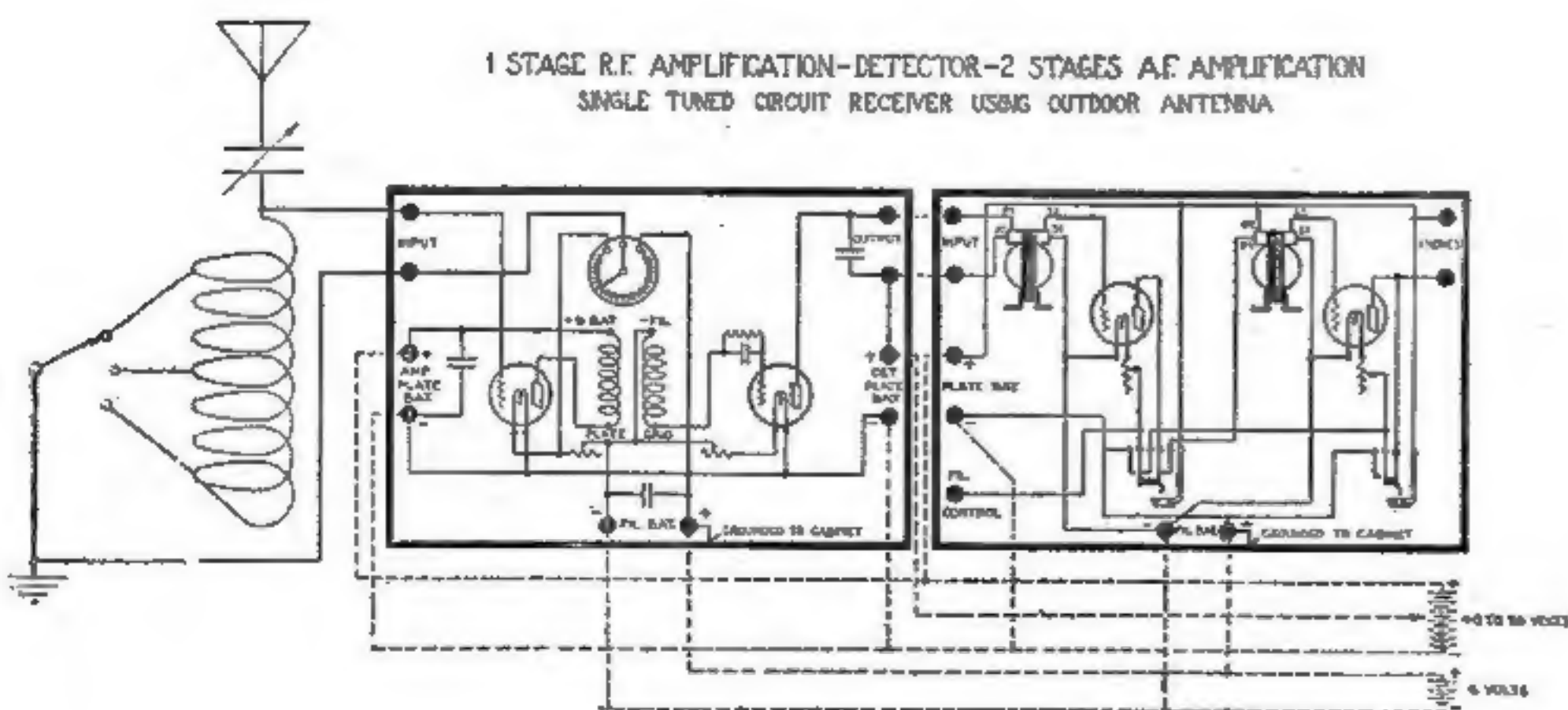
UNIT COMBINATIONS



DIMENSIONS OF LOOP ANTENNA

No. 18 S. C. C. WIRE

Length of Side of Square	Number of Turns	Spacing	Type of Condenser	Wave Length Range
15 inches	18	$\frac{1}{8}$ inch	Federal No. 45	250-550
30 inches	12	$\frac{3}{8}$ inch	Federal No. 45	250-600
36 inches	9	$\frac{1}{2}$ inch	Federal No. 45	200-450
72 inches	4	$\frac{1}{4}$ inch	Federal No. 45	200-450
96 inches	3	$\frac{1}{2}$ inch	Federal No. 45	250-450



FEDERAL D. X. TYPE 58 RECEIVER

The FEDERAL D. X. receiver is especially suited for use by the Radio Amateur who desires a receiver that is more selective than is the single tuned circuit receiver, Federal No. 57. The greater selectivity of the Federal D. X. receiver is secured thru the use of two tuned circuits, provided with controls which make it possible by a series of simple adjustments to secure a degree of selectivity quite exceptional for a receiver as simple in operation as the Federal D. X.

The Receiver is exceedingly sensitive and makes reception possible over ranges greater than can be accomplished with the more ordinary means of amplification.

It can be used with a wide variety of antennas and it may be used for the reception of broadcast radio telephone signals with almost any type of antenna. It serves admirably for the reception of amateur telegraph or telephone signals on the shorter wave length, and thru the use of the Federal Radio Frequency Amplifying transformers gives exceptionally high sensitiveness with high selectivity.

The tuning circuit consists of an antenna tuning inductance, a secondary circuit inductance, with variable induction coupling between the two inductances, and a secondary circuit tuning condenser. The antenna circuit inductance is equipped with an inductance switch which allows a very exact tuning of the antenna circuit while the secondary circuit condenser allows of precise tuning of that circuit.

The coupling between the circuits is variable between very wide limits and makes possible adjustment of the receiver to almost any degree of selectivity.

The amplifying system consists of one stage of radio frequency amplification, a detector tube and two stages of Audio Frequency Amplification.

amplification, which so greatly augments the amplification made available through the R. F. amplifying transformers, is accomplished through the use of the Federal 226-W audio frequency amplifying transformers in conjunction with U. V. 201 vacuum tubes or their equivalents. Provision is made for the use of a sensitive detector tube such as the U. V. 200 vacuum tube.

Control knobs are supplied for the adjustments of the primary antenna circuit inductance, primary-secondary coupling, and secondary condenser. An amplification control knob allows the variation of the amplification between wide limits and separate filament control rheostats, allows of the careful adjustment of the filament currents of individual vacuum tubes.

Such parts as tube sockets, filament rheostats, filament control jacks, etc., are standard high quality product and each contributes its share to making a device unrivalled in quality of material and workmanship.

The entire unit is mounted on a polished panel which is assembled in a metal case, finished in dull black enamel. The receiver as a whole is a device of remarkable beauty of line and finish as well as one of unrivalled effectiveness.



The R. F. Amplification of which this receiver is capable is exceptionally high and results from the use of the Federal No. 29 or No. 30 Radio frequency amplifying transformer, both of which are supplied with the receiver, in conjunction with a U. V. 201 vacuum tube or its equivalent. The two stages of audio frequency

D. X. Type No. 58 Receiver..... \$116.00 each
(Without tubes, batteries or telephones)

FEDERAL R. F. AMPLIFYING TRANSFORMERS



The Federal R. F. Transformers open a completely new field of amplification to the Radio Experimenter. Until this time, the greatest amplification that could be accomplished satisfactorily has been that possible with two or, at most, three stages of audio frequency amplification and unless a highly efficient transformer such as the Federal 226-W transformer was used for this purpose the amplification possible was, of course, seriously limited.

Radio frequency amplification in addition to the high degree in which it is effective is to be even more highly recommended since it may be used in connection with audio frequency amplification and thereby augments the latter in a tremendous degree. And it does all this without effecting in the least the degree of stability of amplification possible by the audio frequency method. In effect it makes the audio frequency amplifier with which it is used more effective and not only does it not introduce extraneous noises as does the older type of amplification when used in excessive degrees, but the degree by which it amplifies extraneous noises is considerably less than the degree of its amplification of the desired signal.

These admirable characteristics of radio frequency amplification have been developed to the utmost in the Federal Radio Frequency Amplifying Transformers and through their use the overpowering advantages of this method of amplification may be taken advantage of to the utmost with the greatest degree of simplicity and reliability that is possible with such a sensitive device as the radio frequency amplifier.

The Federal Radio Frequency Transformers have been designed on the basis of very comprehensive research and, by actual measurement show a greater range of wave lengths over which they are capable of a higher degree of amplification than do any other similar devices. The No. 29 R. F. Transformer is recommended for use between 175 and 300 meters, the No. 30 may be used for reception on wavelengths between 275 and 600 meters, while the No. 31 transformer may be used on the wave lengths between 500 and 1,000 meters. Their wave length range ratings as given above are very conservative so that the use may be assured of maximum amplification over the specified ranges but it will be found possible to use these transformers at wave lengths in excess of those given by their ratings but at some sacrifice in amplification.

Only three transformers are listed herewith, but it is planned to make available to the radio experimenter a complete line of transformers so that Radio Frequency Amplification can be accomplished at any wave length.

These transformers should be used only with the U. V.-201 and U. V.-200 vacuum tubes or their equivalents and great care must be taken to see that all inter-connections are as short and direct as possible.

In using these transformers it is recommended that not more than two stages, at most, be used in connection with receiving equipment using an antenna, since the amplification is so great that additional amplification is not proportionately effective because of the limitation imposed on any amplifying scheme by the presence of static. By the use of three stages of amplification, however, a small loop antenna may be made to serve the function of the antenna and it will be found possible to secure the same range of reception with such a loop and three stages of Federal Radio Frequency Amplification as can be accomplished ordinarily with a large outdoor antenna.

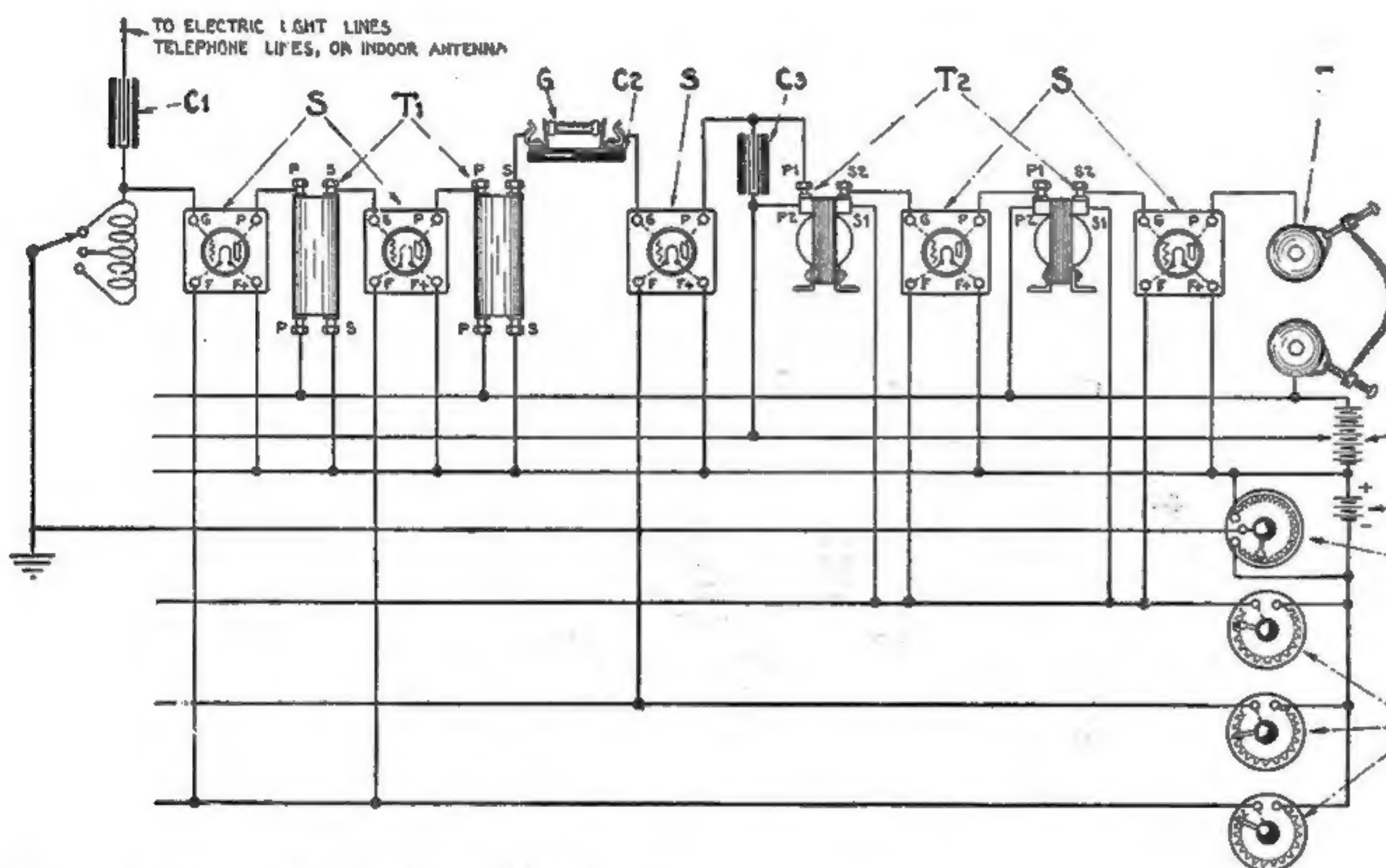
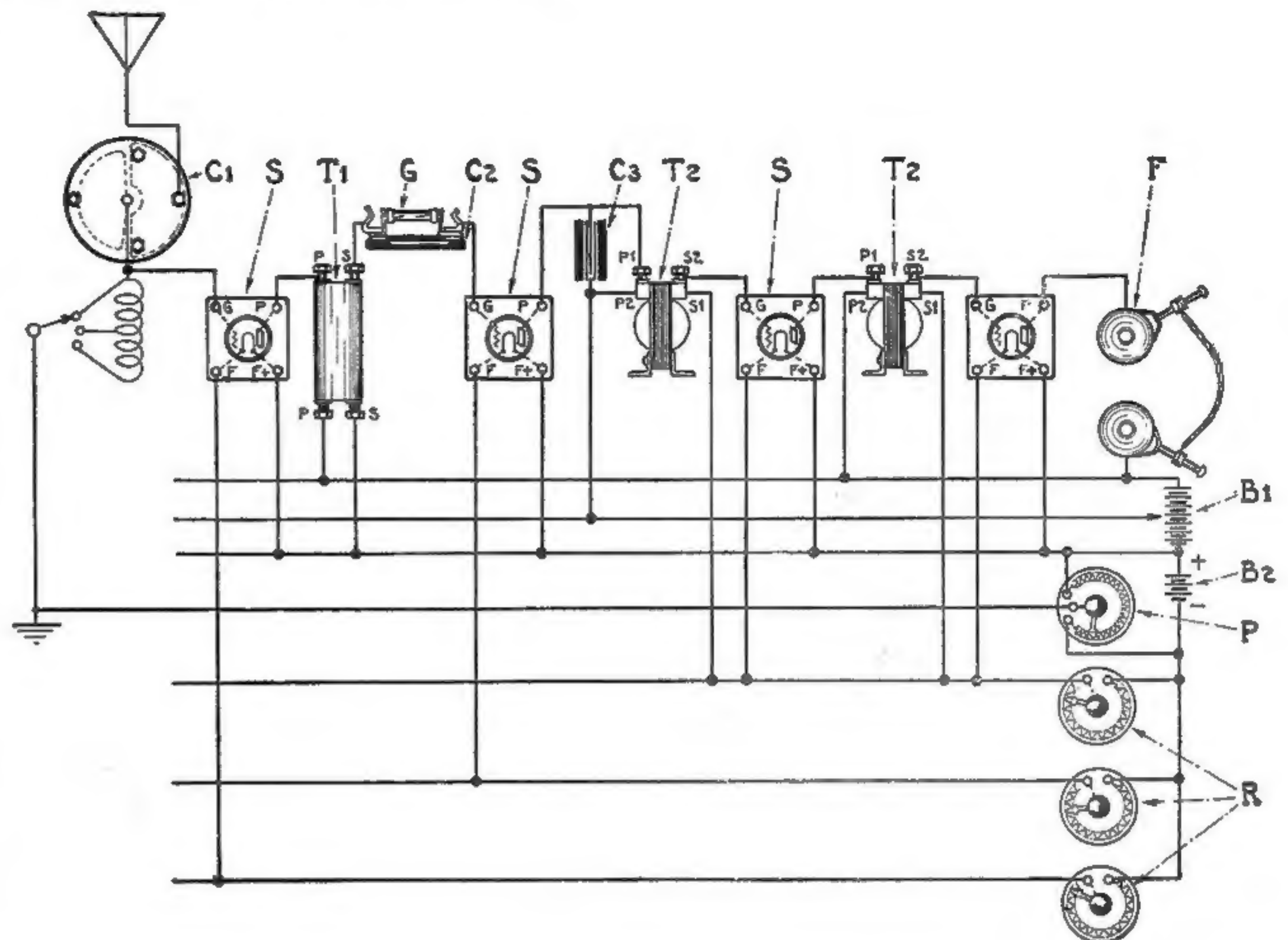
These transformers are particularly effective in making it possible to accomplish reception with any of the many make-shift types of antennas, such as the small indoor antenna, any of the many schemes for using the electric light lines and telephone lines, etc.

No. 29 Federal R. F. Transformer—Wave Length 175-300	\$5.50 each
No. 30 Federal R. F. Transformer—Wave Length 275-600	5.50 each
No. 31 Federal R. F. Transformer—Wave Length 500-1000	5.70 each
No. 40 Federal R. F. Transformer Mounting only80 each

R. F. AMPLIFIER CIRCUITS

One Stage R. F. Amplification—Detector—Two Stages A. F. Amplification Single Tuned Circuit Receiver For Use With Outdoor Antenna

	Each
B 1 Two or more No. 7660-W.....	\$3.00
B 2 No. 7670-W	15.00
C 1 No. 44 Variable Condenser 7 plate	2.75
C 2 No. 120 Grid Condenser and Mounting75
C 3 No. 245-W .005 M. F.....	1.20
F No. 52-W Head Telephones.....	10.50
G No. 122 Grid Leak.....	.75
P No. 24 Potentiometer	1.50
R Filament Rheostats.....	
S No. 16 Sockets	1.00
T 1 No. 29 or 30 R. F. Transformer..	5.50
No. 40 R. F. Transformer Mounting80
T 2 No. 226-W A. F. Transformer....	7.00

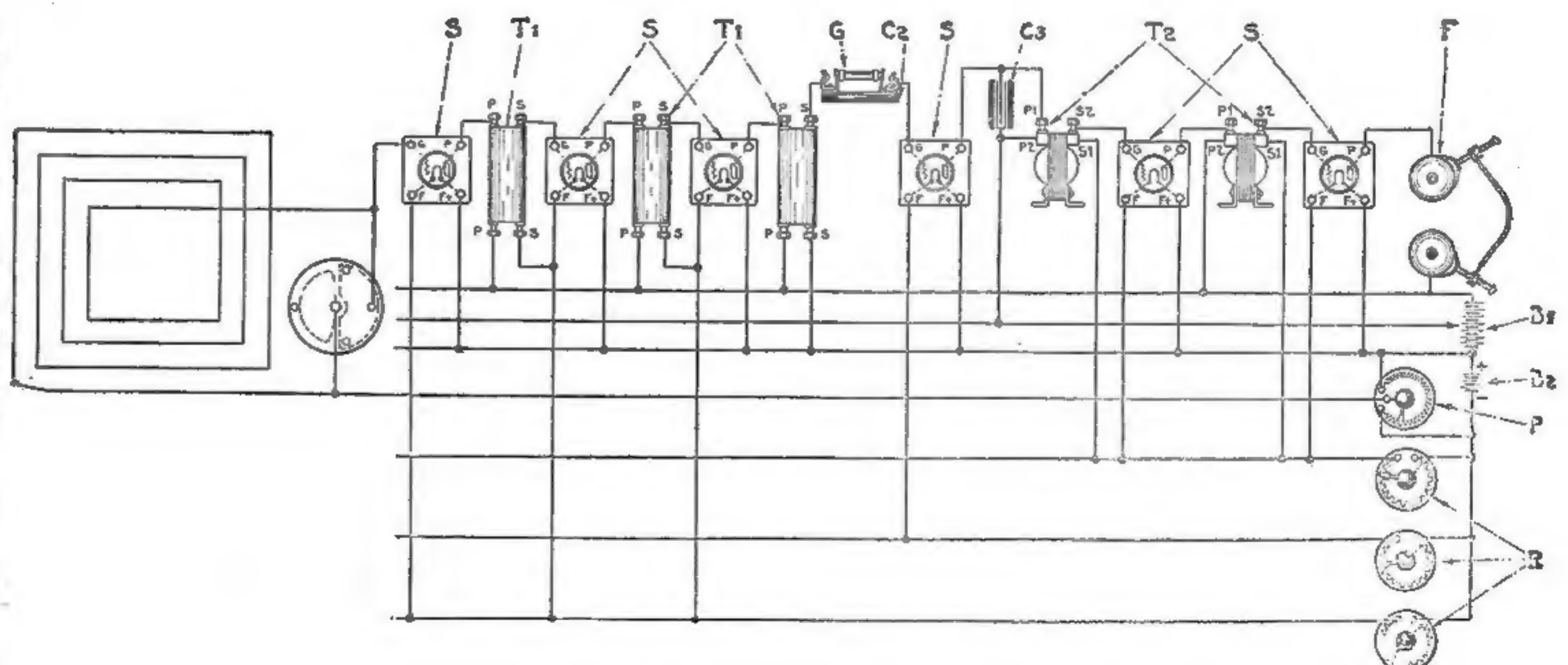


Two Stages R. F. Amplification—Detector—Two Stages A. F. Amplification Single Tuned Circuit Receiver For Use With Indoor Antenna, Electric Lighting Lines or Telephone Lines

	Each
B 1 Two or more No. 7660-W.....	\$3.00
B 2 No. 7670-W	15.00
C 1 No. 243-W Condenser 250 MMF..	.85
C 2 No. 120 Grid Condenser and Mounting75
C 3 No. 245-W Condenser .005 M. F..	1.10
F No. 52-W Head Telephones.....	10.50
G No. 122 Grid Leak.....	.75
P No. 24 Potentiometer	1.50
R Filament Rheostats	
S No. 16 Sockets	1.00
T 1 No. 29 or 30 R. F. Transformers.	5.50
No. 40 R. F. Transformer Mounting80
T 2 No. 226-W A. F. Transformer....	7.00

Three Stages R. F. Amplification—Detector—Two stages A. F. Amplification Receiver For Use With Loop

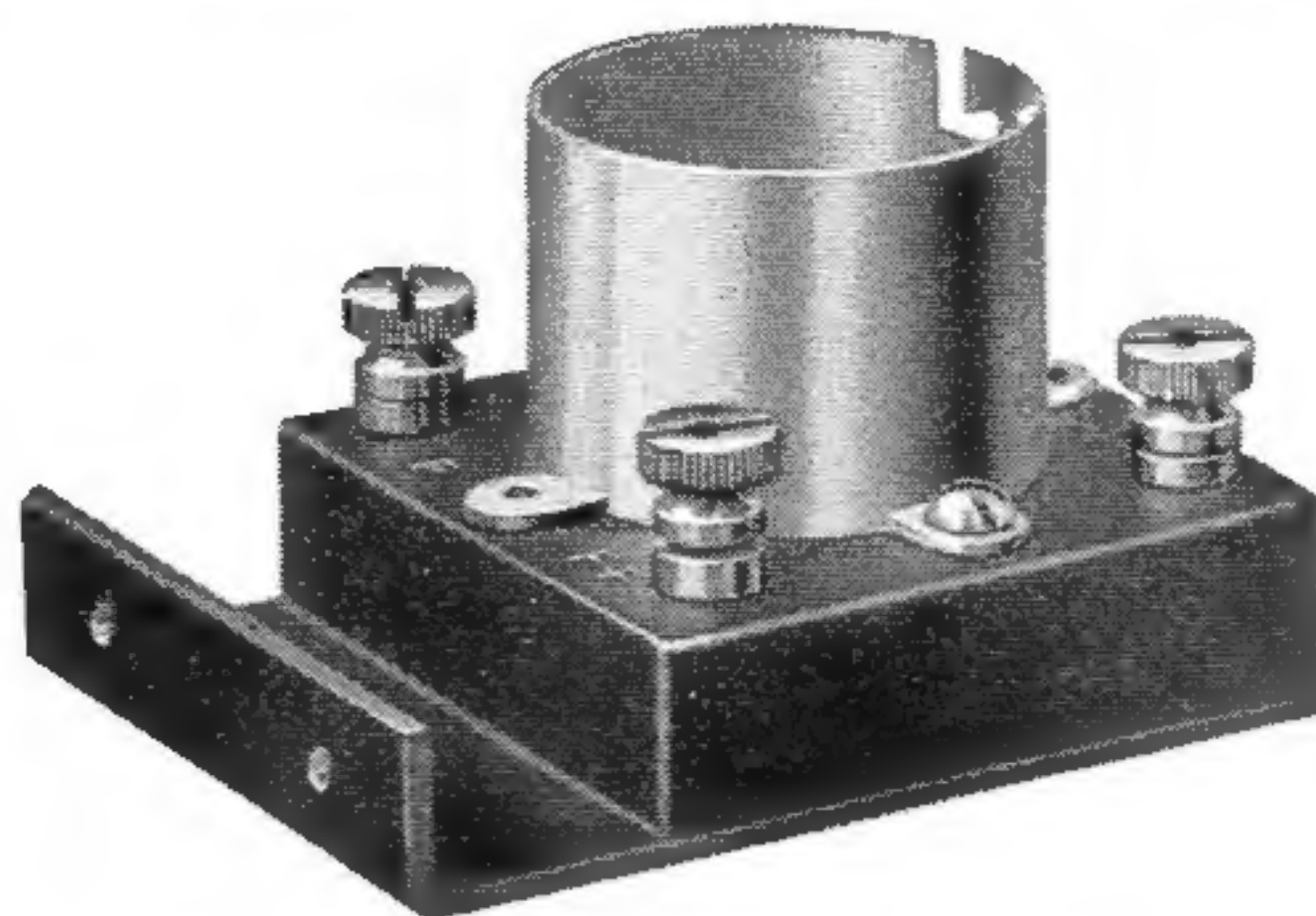
	Each
B 1 Two or more No. 7660-W...	\$3.00
B 2 7670-W	15.00
C 1 No. 45-11 plate Variable Condenser	2.85
C 2 No. 120 Grid Condenser and Mounting75
C 3 No. 245-W Condenser .005..	1.10
F No. 52-W Head Telephones.	10.50
G No. 122 Grid Leak.....	.75
P No. 24 Potentiometer.....	1.50
R Filament Rheostats.....	
S No. 16 Sockets	1.00
T 1 No. 29 or 30 R. F. Transformers	5.50
No. 40 R. F. Transformer Mounting80
T 2 No. 226-W A.F. Transformers	7.00



FEDERAL R. F. AMPLIFICATION ACCESSORIES

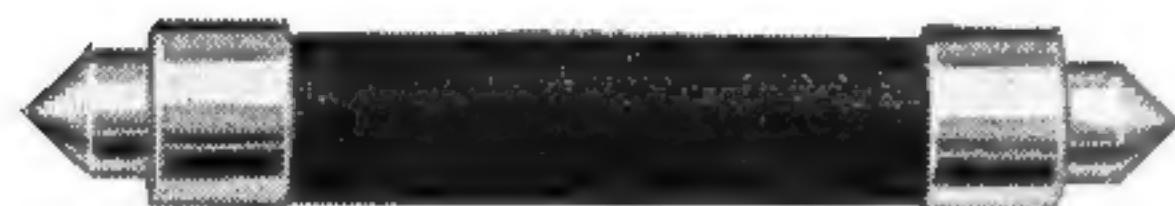
FEDERAL VACUUM
TUBE SOCKET
FOR
PANEL MOUNTING

No. 21..... \$1.20

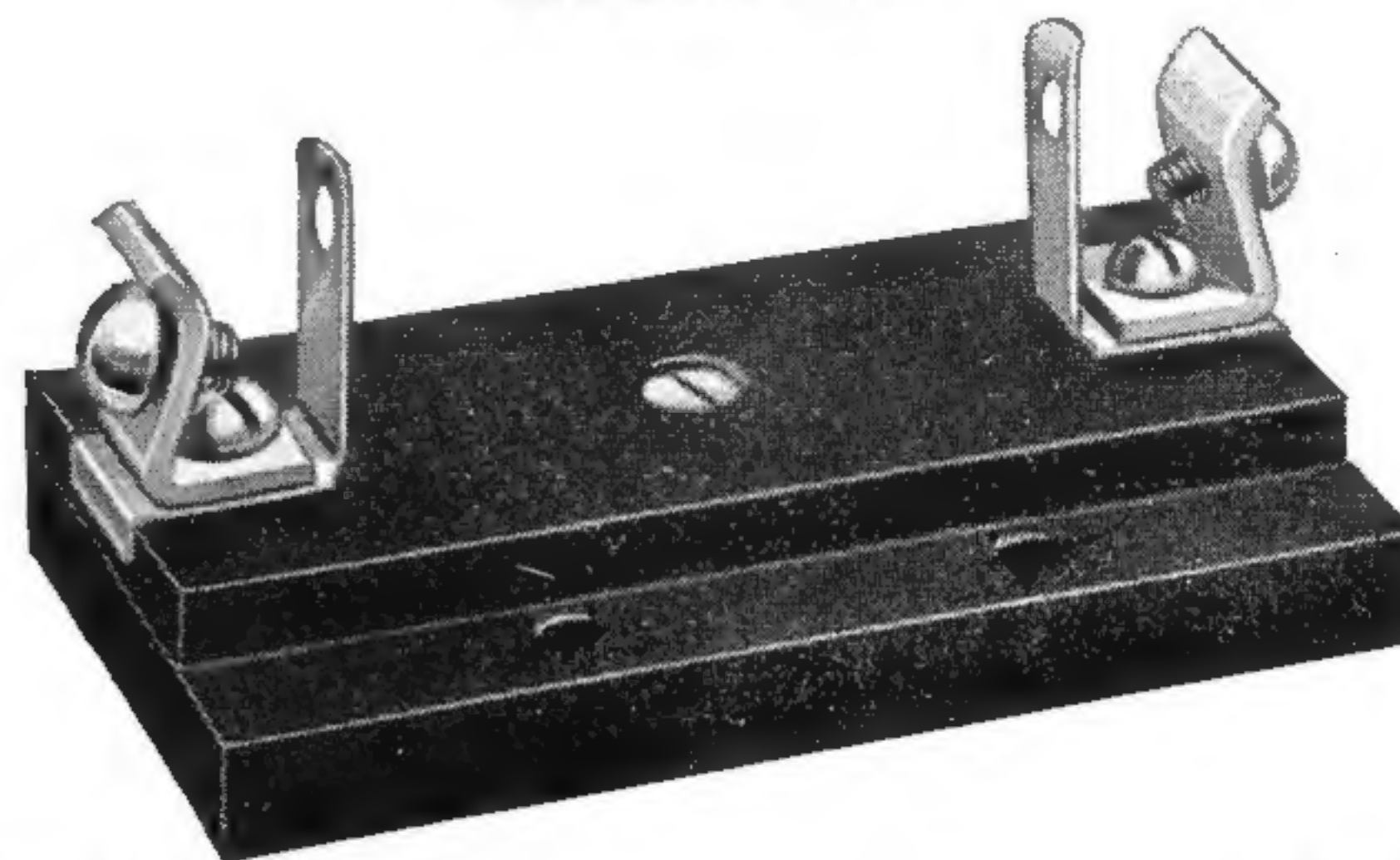
FEDERAL VACUUM
TUBE SOCKET
FOR
TABLE MOUNTING

No. 16..... \$1.00

FEDERAL GRID LEAK



No. 121—	½ meg.....	\$.75 each
No. 122—	1 meg.....	.75 each
No. 123—	1½ meg.....	.75 each
No. 124—	2 meg.....	.75 each
No. 125—	2½ meg.....	.75 each
No. 126—	3 meg.....	.75 each
No. 127—	3½ meg.....	.75 each
No. 128—	4 meg.....	.75 each
No. 129—	5 meg.....	.75 each

FEDERAL GRID CONDENSER AND GRID LEAK
MOUNTING

No. 119—Mounting only \$.50 each
 No. 120—With Condenser in Base..... .75 each

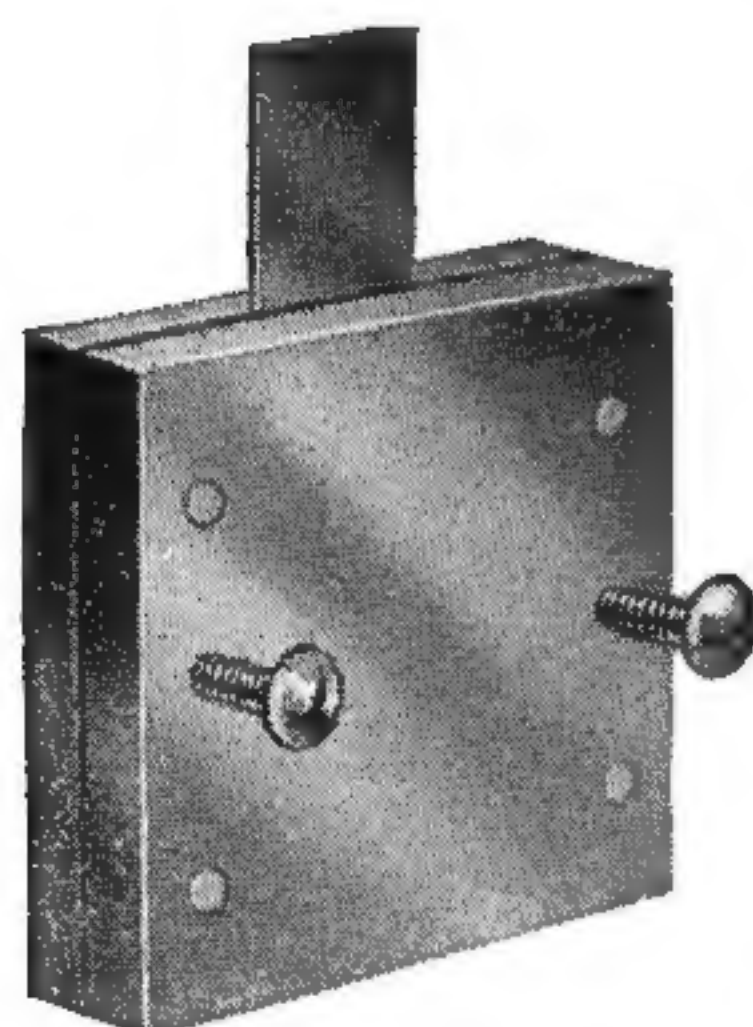
FEDERAL RADIO FREQUENCY

BY-PASS CONDENSERS
FEDERAL PAPER TYPE

No. 130—	1/10 Mfd. .1.	\$.50 each
No. 131—	1/20 Mfd. .05.	.50 each
No. 132—	½ Mfd. .5..	.75 each
No. 133—	1 Mfd. 1..	1.00 each
No. 134—	1½ Mfd. 1.5..	1.25 each

FEDERAL MICA TYPE

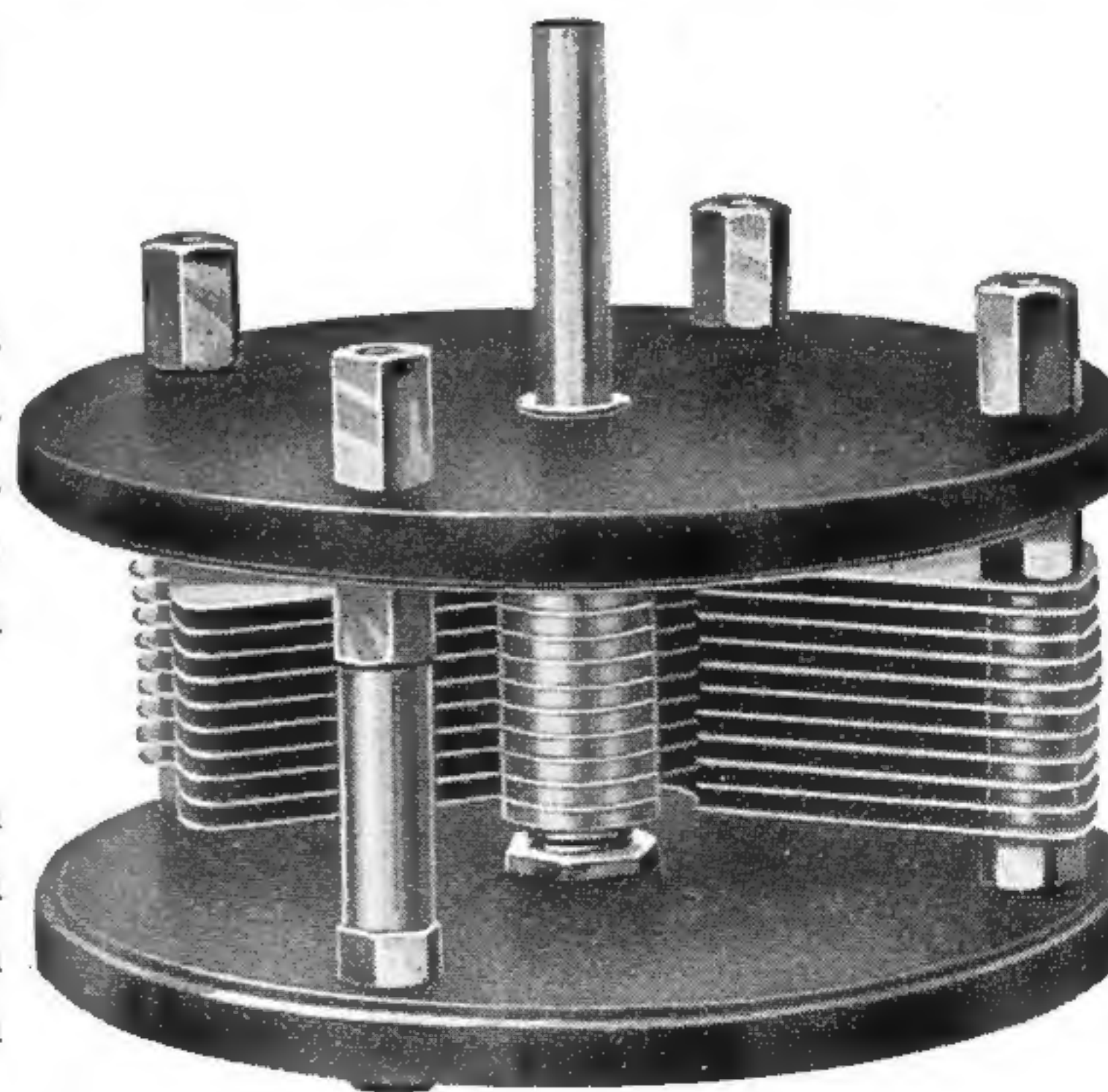
No. 242—	.000125 Mfd..	\$.85 each
No. 243—	.000250 Mfd..	.85 each
No. 244—	.001 Mfd..	.95 each
No. 245—	.005 Mfd..	1.10 each



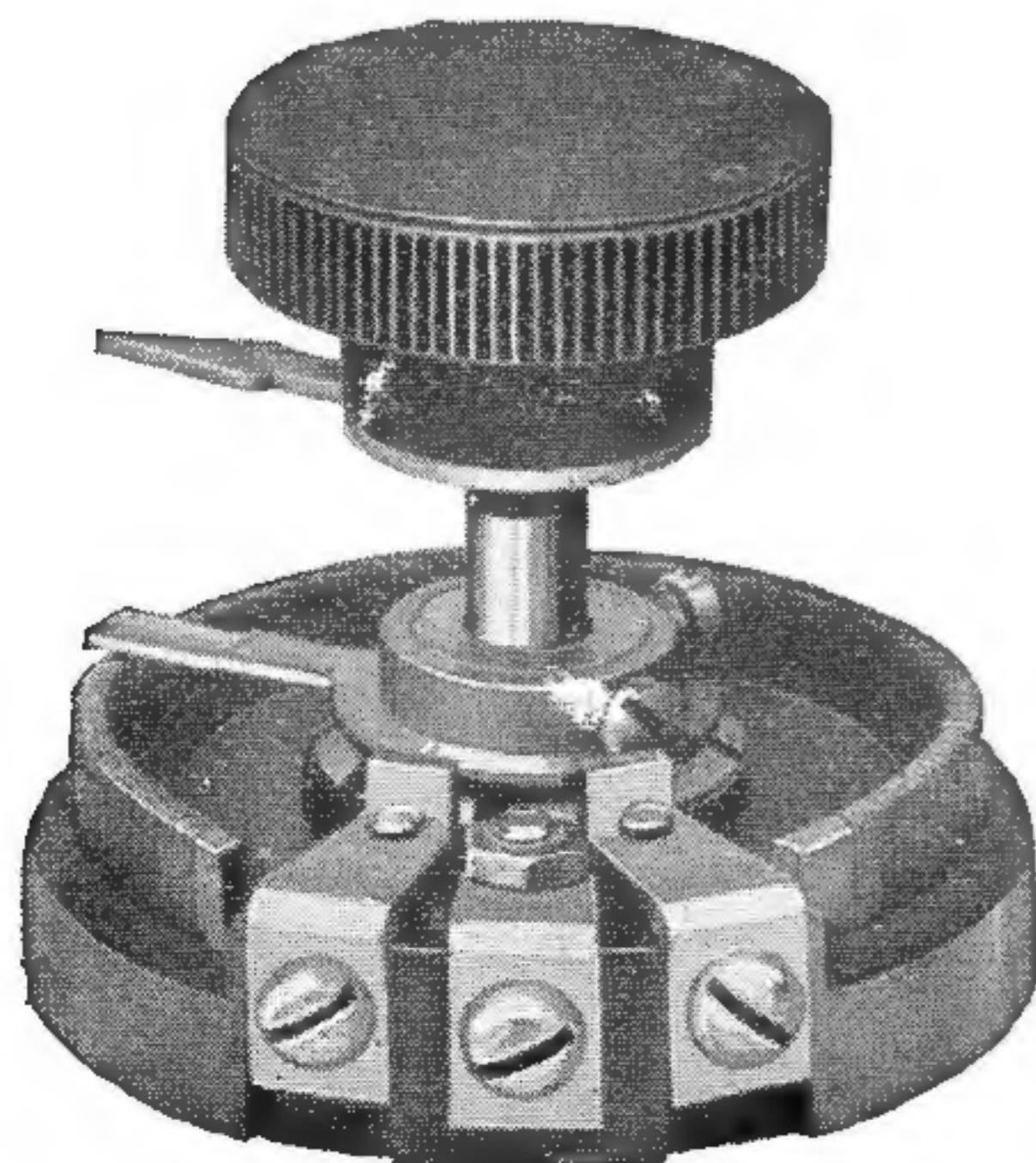
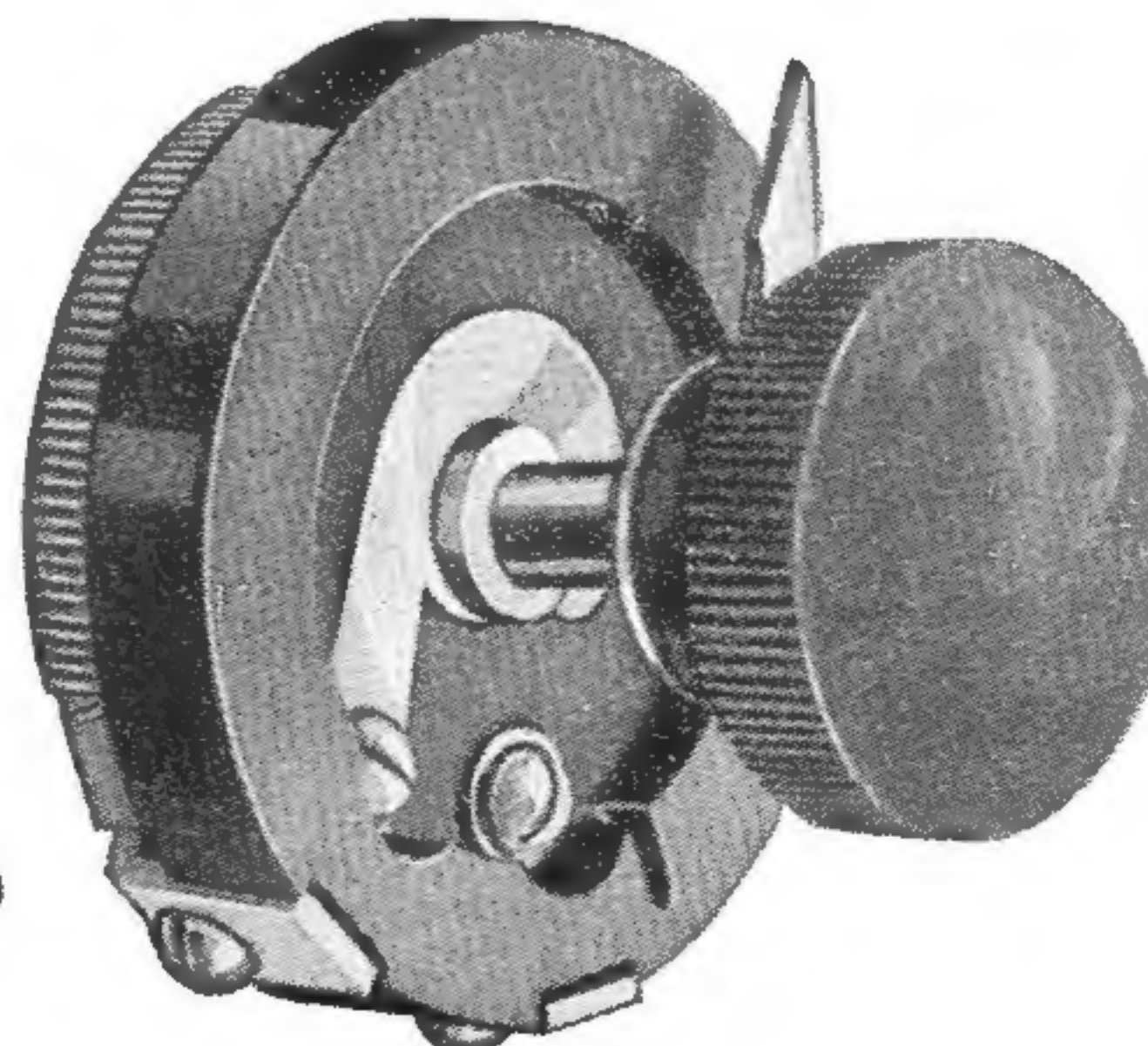
MICA TYPE

FEDERAL
VARIABLE
CONDENSERS
Without Knob
and Dial

No. 44—	7 plate	\$2.75
No. 45—	11 plate	2.85
No. 46—	21 plate	3.20
No. 47—	43 plate	4.30

FEDERAL KNOB
AND DIAL
No. 7.... \$1.50 eachFEDERAL
POTENTIOMETER
For Panel or Table
Mounting

No. 24 \$1.50

FEDERAL
FILAMENT
RHEOSTAT
For Panel or Table
Mounting
No. 18 \$1.10

TECHNICAL DISCUSSION

In the past the need for means for effectively amplifying radio telephone and telegraph signals has been met by methods for amplifying the telephone currents made available thru the medium of a detector either of the vacuum tube or crystal type. This problem is a comparatively simple one since it involves the manipulation of currents of comparatively low frequencies. These currents, since their frequencies are of the order of 50 to 5000 cycles per second are identical in their nature with telephone currents and have been operated upon by the same methods and with the same types of equipment as have been used in voice transmission in the very common wire telephony. The problems met with in the design and operation of such amplification equipment are comparatively simple since the characteristics of the commonly available materials at voice frequencies are well known and the means for investigations of the incidental phenomena well established.

Low frequency amplification notwithstanding its comparative simplicity has its very definite limitations and disadvantages. By its very nature it amplifies interfering signals and noises as well as those that are desired and, unless great care is used in the design and construction of the equipment, it introduces by its use interfering sounds that may make the amplified signals less intelligible than the unamplified and weaker signals.

This latter difficulty has been satisfactorily overcome in the careful design of the several Federal Amplifiers, however, but not without a definite limitation as to the degree of amplification that may be secured by this method of amplification.

Experience has shown, for instance, that with a highly effective amplifier of the inductively coupled type several cascade stages of tube-transformer combinations are quite reliable and satisfactory in operation, but that the addition of one or more additional stages does not make available increased amplification but, on the other hand, the whole system is made unusable by the resultant noises, usually of the form of "singing" or "howling."

This "howling" is usually due to interactions in the amplifier that are quite inherent in tube-transformer combinations and usually limits effective amplification to two or three cascade stages.

It has therefore been necessary to devise some other means for extending the degree of amplification that may be secured beyond that of the audio frequency or voice frequency amplifier of ordinary radio practice. The obvious means to secure this increased amplification is that of the amplification of the signal energy as it exists in the antenna circuit and before it has been rectified by the detector. The signal energy before passing thru the detector exists in the form of currents having exceedingly high frequency; in broadcast telephone reception, for instance, the frequency of these currents is approximately 800,000 cycles and hence many times the frequency of the voice currents as they leave the detector.

The scheme of amplification at two different frequencies, namely first, at the radio frequency as it exists before the signal current is rectified by the detector and at the voice frequencies as they exist after rectification by the detector is doubly well suited to the characteristics of the cascade amplifying scheme and rectification by such detectors as crystals and vacuum tubes. This comes about thru the fact that while the number of cascade steps of amplification at any frequency is quite definitely limited by the "howling" which results from the use of too many stages, it is quite possible to amplify the unrectified radio frequency currents with several cascade steps of tube-transformer combinations and then after the signal currents have been rectified by the detector to amplify the voice frequency currents without serious interaction between the radio frequency amplification and voice frequency amplification systems so that as many stages of voice frequency amplification may be used as when no radio frequency amplification is used. The Radio Frequency Amplifier therefore, allows us to secure additional amplification which may be used either with or without the well established methods of voice frequency amplification. Another and exceedingly important advantage arises from the fact that in the use of the vacuum tube and a detector the response in the telephones in the plate circuit for a given signal voltage applied to the grid, is not directly proportional to the voltage applied to the grid but, on the other hand, for grid voltages less than a certain limiting value no response results in the telephones while for voltages somewhat in excess of this "threshold value" the response is more nearly proportional to the square or some higher power of this voltage. That is, if by radio frequency amplification between the antenna circuit and the detector tube the voltage made available to the grid of the detector tube is doubled, the telephone response is not doubled, but is increased to four or more times its original value.

Thus not only is it possible to secure greater amplification without serious instability and "howling" thru the use of R. F. amplification but by its means it is possible to make available signals of such insignificant intensity as would be quite indistinguishable without it and where signals of noticeable intensity are available to take advantage of the square law of the detector by amplifying before rectifying.

These several fundamental principles have been taken advantage of to the maximum in the Federal R. F. Transformers. These transformers have been designed especially for use with the U. V. 201 Radiotron and when used with this tube, all connections being carefully made as short and as direct as possible will give satisfactory operation over the wave length between 175 and 300 meters; 275 and 550 meters, and 500 and 1000 meters.

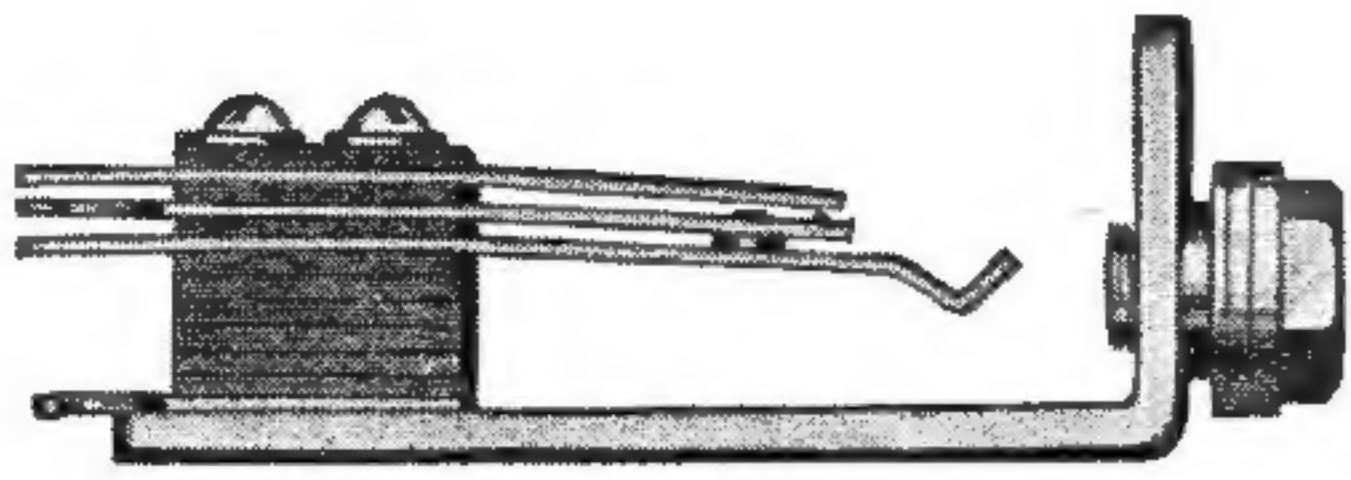


FEDERAL HEAD TELEPHONES

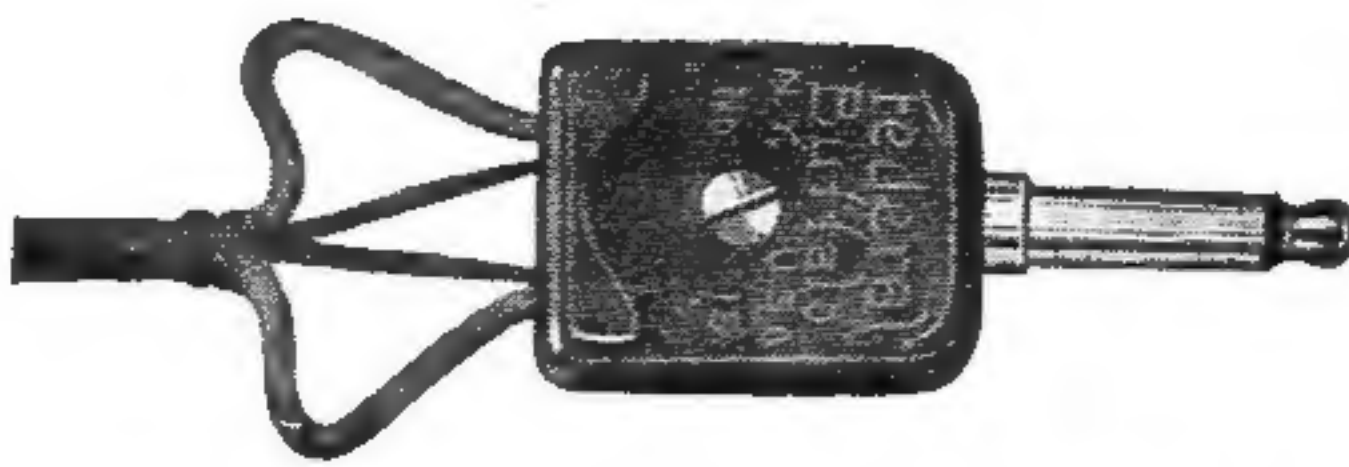
The sensitiveness and durable efficiency of the FEDERAL Head Telephone is peculiar to the FEDERAL Head Telephone alone. Twelve years of manufacturing Head Telephones, together with constant experimenting in order that they might attain a still higher degree of efficiency, enables us to offer the FEDERAL Head Telephone which stands so high in the favor of all Radio enthusiasts.

Code No.	Type	Resistance	Price
No. 52-W	Double	3200 ohms	\$10.50 each
No. 53-W	Double	2200 ohms	8.00 each
No. 51-W	Single	75 ohms	4.75 each
No. 54-W	Single	1600 ohms	6.90 each
No. 50-W	Single	1100 ohms	5.65 each

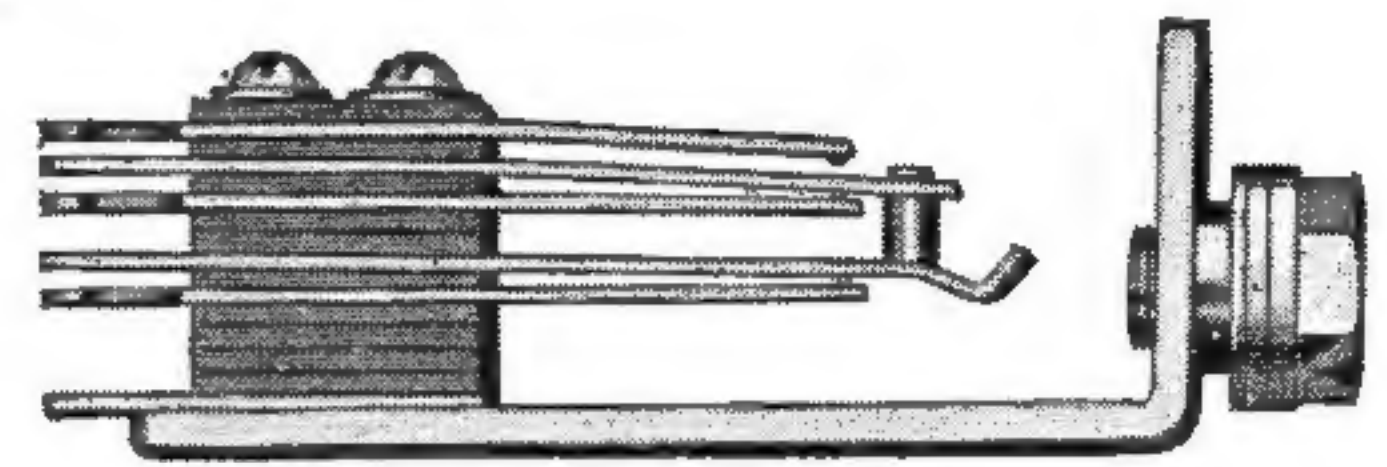
Federal Automatic Filament Control Jacks and Circuits



No. 1435-W Filament Control \$1.00 each



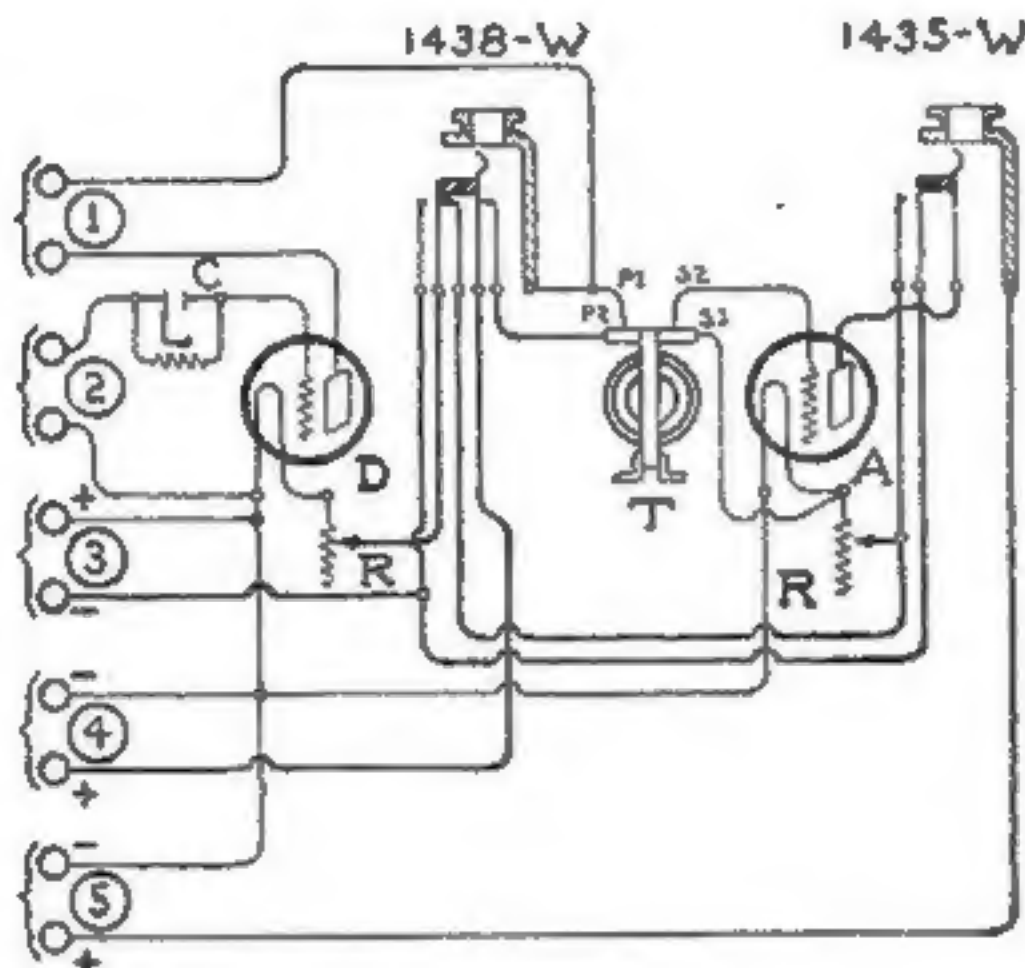
No. 15 Universal Plug, \$1.25



No. 1438-W Filament Control, \$1.20

NOTE

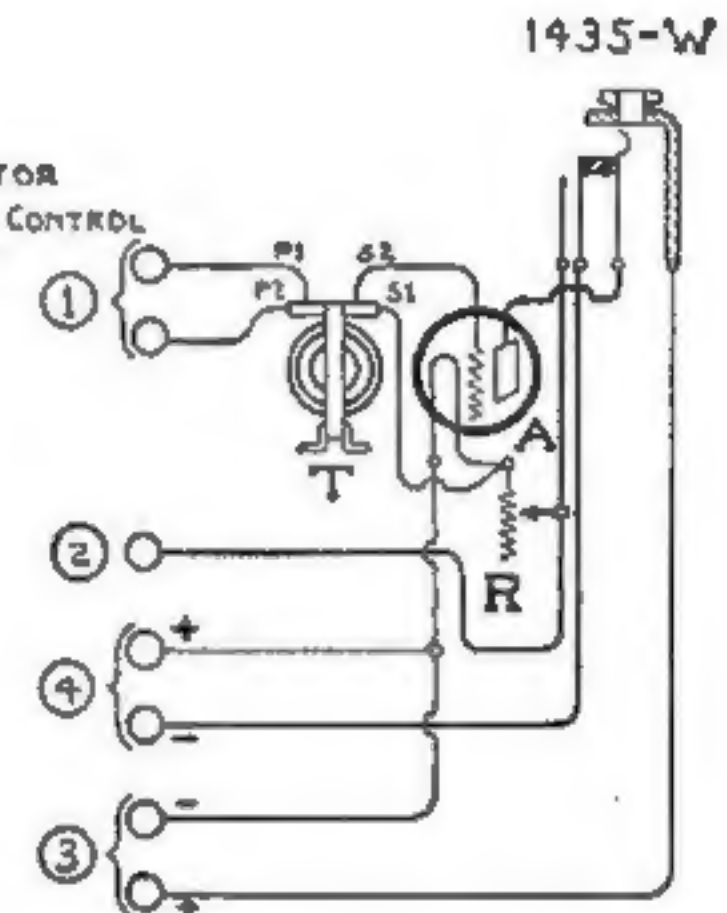
- 1 - To TICKLER COIL
- 2 - To SECONDARY
- 3 - To 'A' BAT 6 VOLTS
- 4 - To 'B' BAT 18 TO 30 VOLTS
- 5 - To 'B' BAT 40 TO 60 VOLTS
- A - AMPLIFIER TUBE
- C - '120 GRID CONDENSER
- D - DETECTOR TUBE
- L - '122 GRID LEAK
- R - '18 RHEOSTAT
- T - 226-W TRANSFORMER



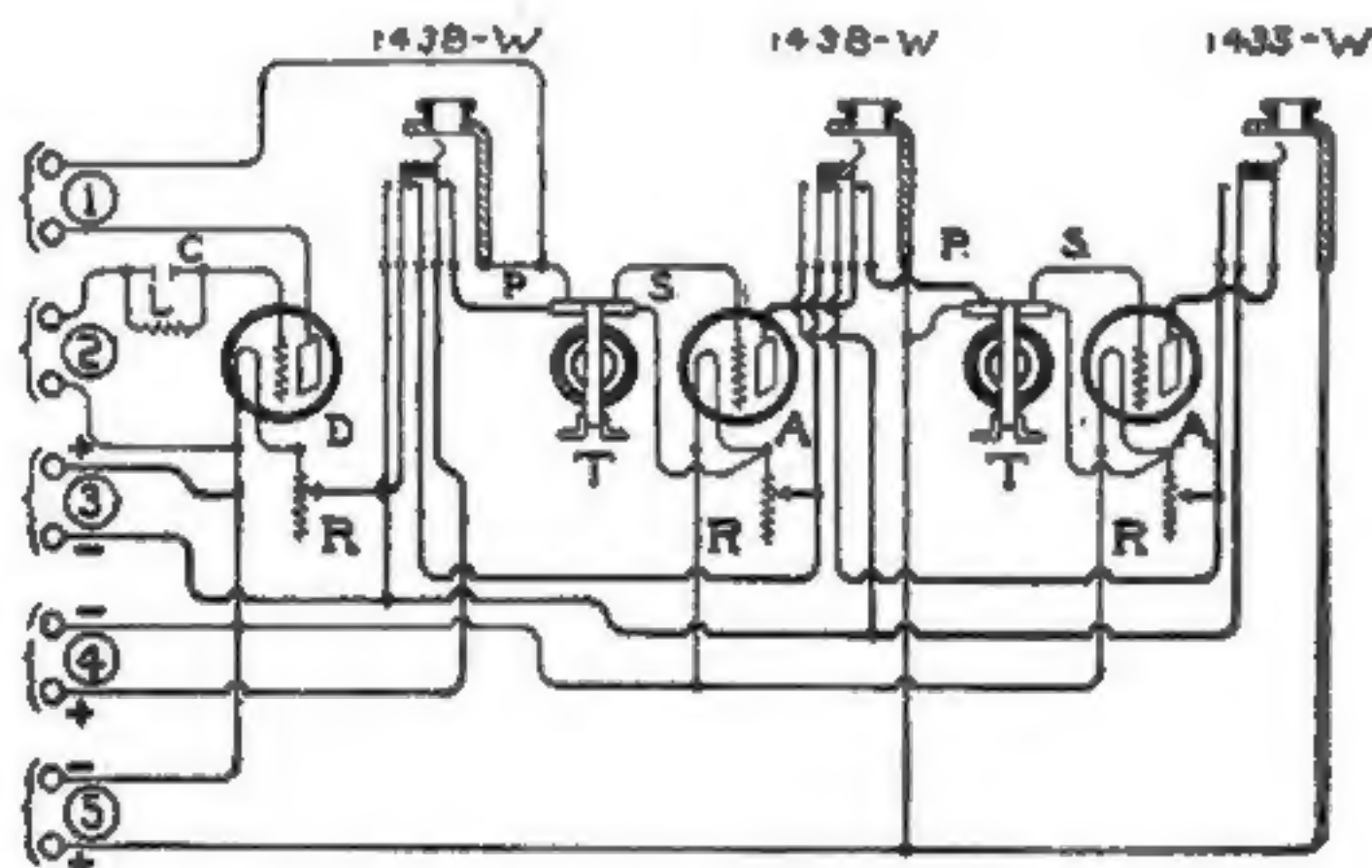
DETECTOR & 1 STAGE AMPLIFIER USING FILAMENT CONTROL JACKS #3668

NOTE

- 1 - To PHONE CONNECTION, DETECTOR
- 2 - To DETECTOR JACK, FILAMENT CONTROL
- 3 - To 'B' BAT 40 TO 60 VOLTS
- A - AMPLIFIER TUBES
- R - RHEOSTAT '18
- T - 226-W TRANSFORMER
- 4 - To 'A' BAT 6 VOLTS



SINGLE STAGE AMPLIFIER USING FILAMENT CONTROL JACKS #3673



DETECTOR & 2 STAGE AMPLIFIER USING FILAMENT CONTROL JACKS

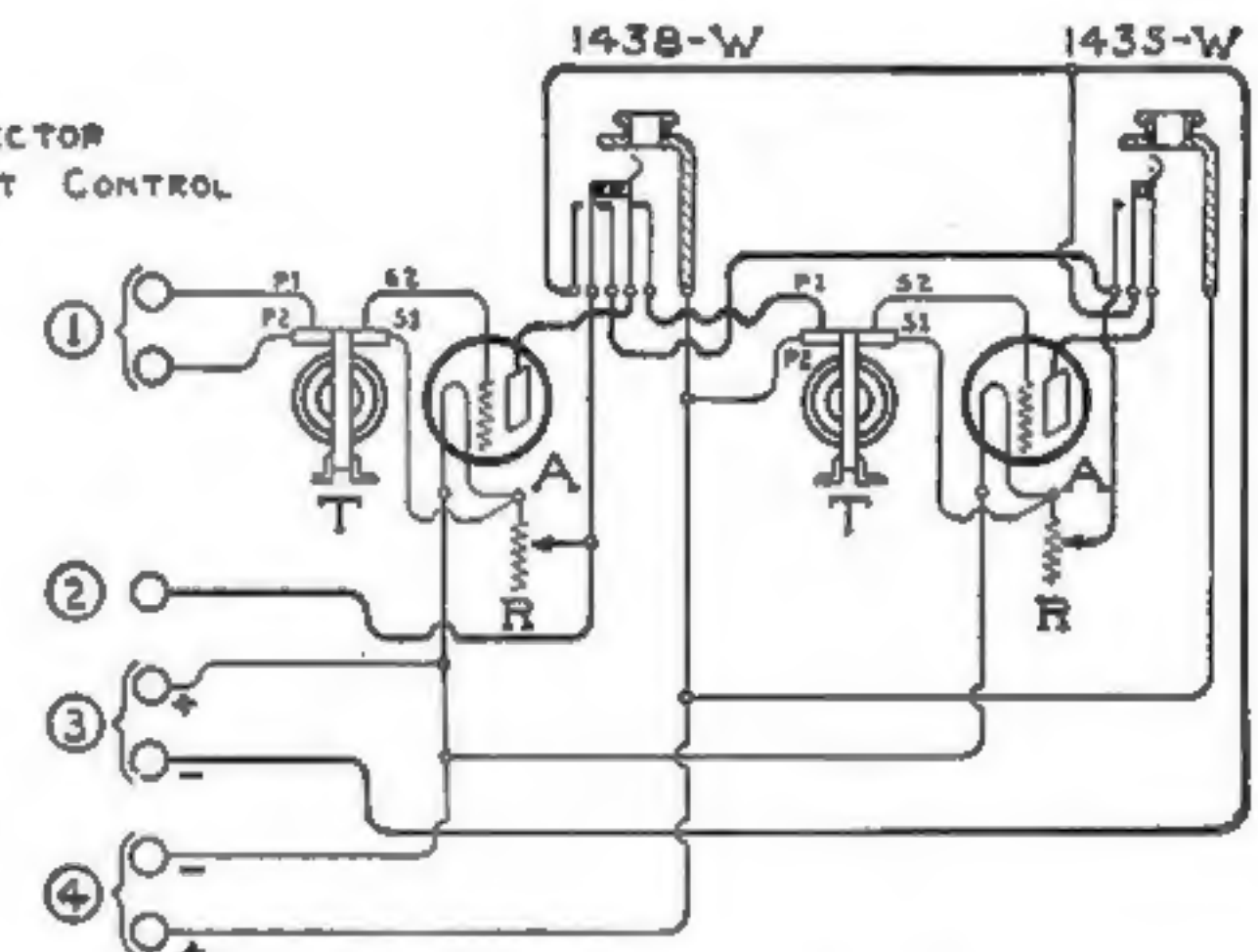
NOTE

- 1 - To TICKLER COIL
- 2 - To SECONDARY
- 3 - To 'A' BAT 6 VOLTS
- 4 - To 'B' BAT 18 TO 30 VOLTS
- 5 - To 'B' BAT 40 TO 60 VOLTS
- C - 3581-W GRID CONDENSER
- D - DETECTOR TUBE
- L - 250-W 2 MES. GRID LEAK
- A - AMPLIFIER TUBES
- R - RHEOSTAT
- T - 226-W TRANSFORMER

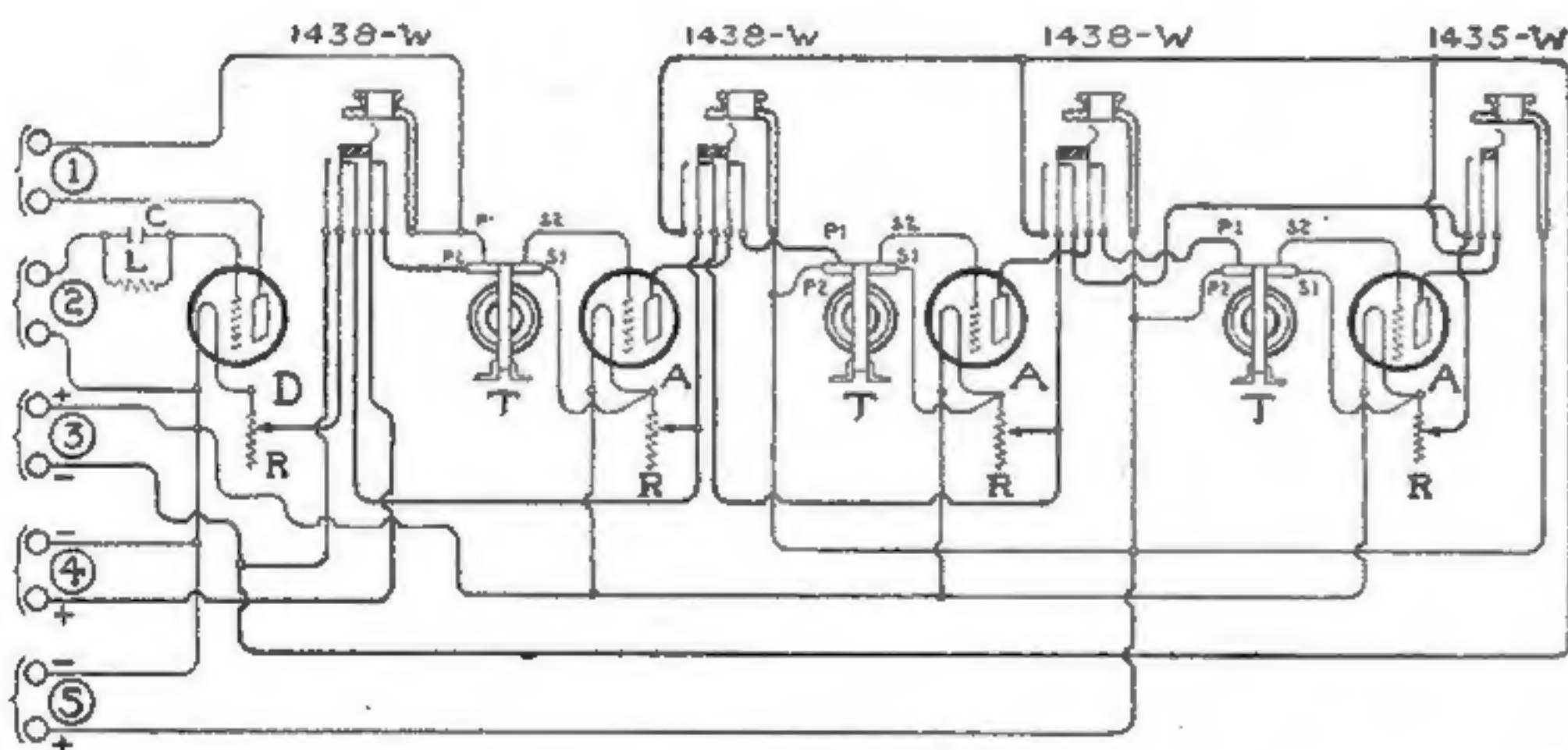
#3667

NOTE

- 1 - To PHONE CONNECTION, DETECTOR
- 2 - To DETECTOR JACK, FILAMENT CONTROL
- 3 - To 'A' BAT 6 VOLTS
- 4 - To 'B' BAT 40 TO 60 VOLTS
- A - AMPLIFIER TUBES
- R - RHEOSTAT '18
- T - 226-W TRANSFORMER



2 STAGE AMPLIFIER USING FILAMENT CONTROL JACKS #3672

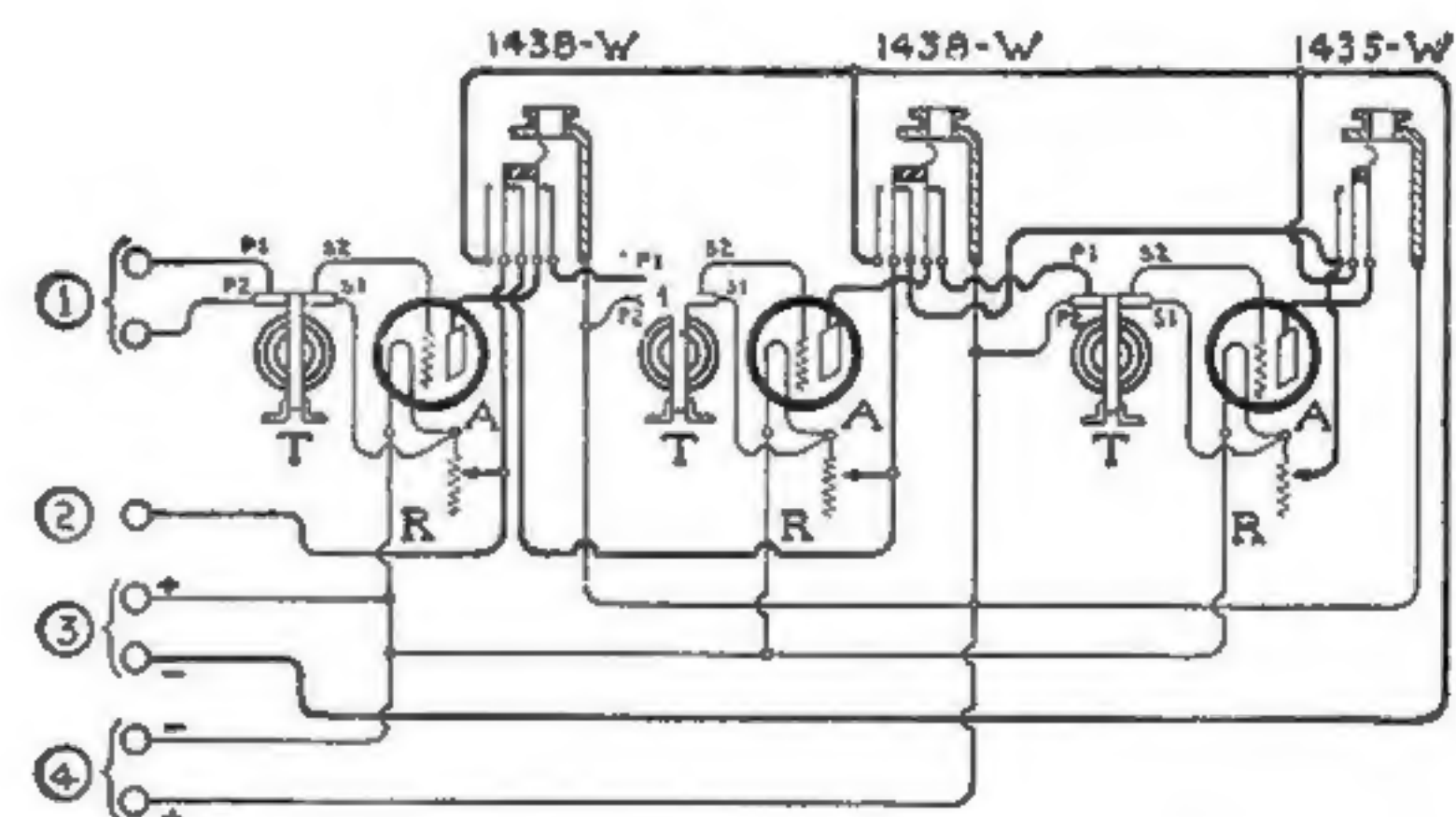


DETECTOR & 3 STAGE AMPLIFIER USING FILAMENT CONTROL JACKS

NOTE

- 1 - To TICKLER COIL
- 2 - To SECONDARY
- 3 - To 'A' BAT 6 VOLTS
- 4 - To 'B' BAT 18 TO 30 VOLTS
- 5 - To 'B' BAT 40 TO 60 VOLTS
- C - '120 GRID CONDENSER
- D - DETECTOR TUBE
- L - '122 GRID LEAK
- A - AMPLIFIER TUBES
- R - '18 RHEOSTAT
- T - 226-W TRANSFORMER

#3666



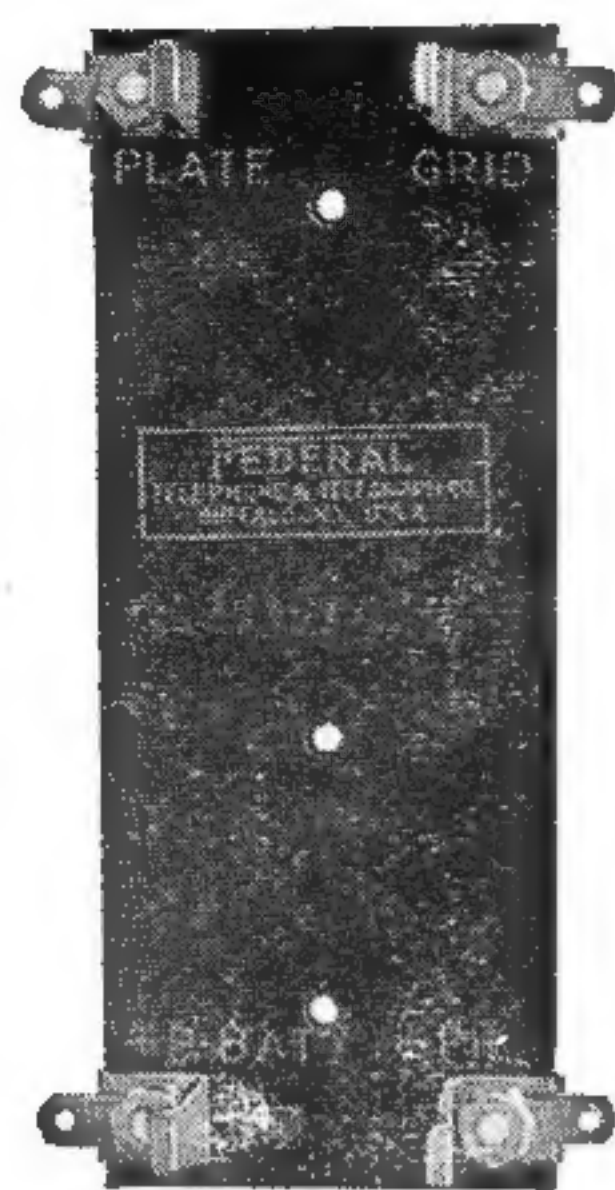
3 STAGE AMPLIFIER USING FILAMENT CONTROL JACKS #3671

NOTE

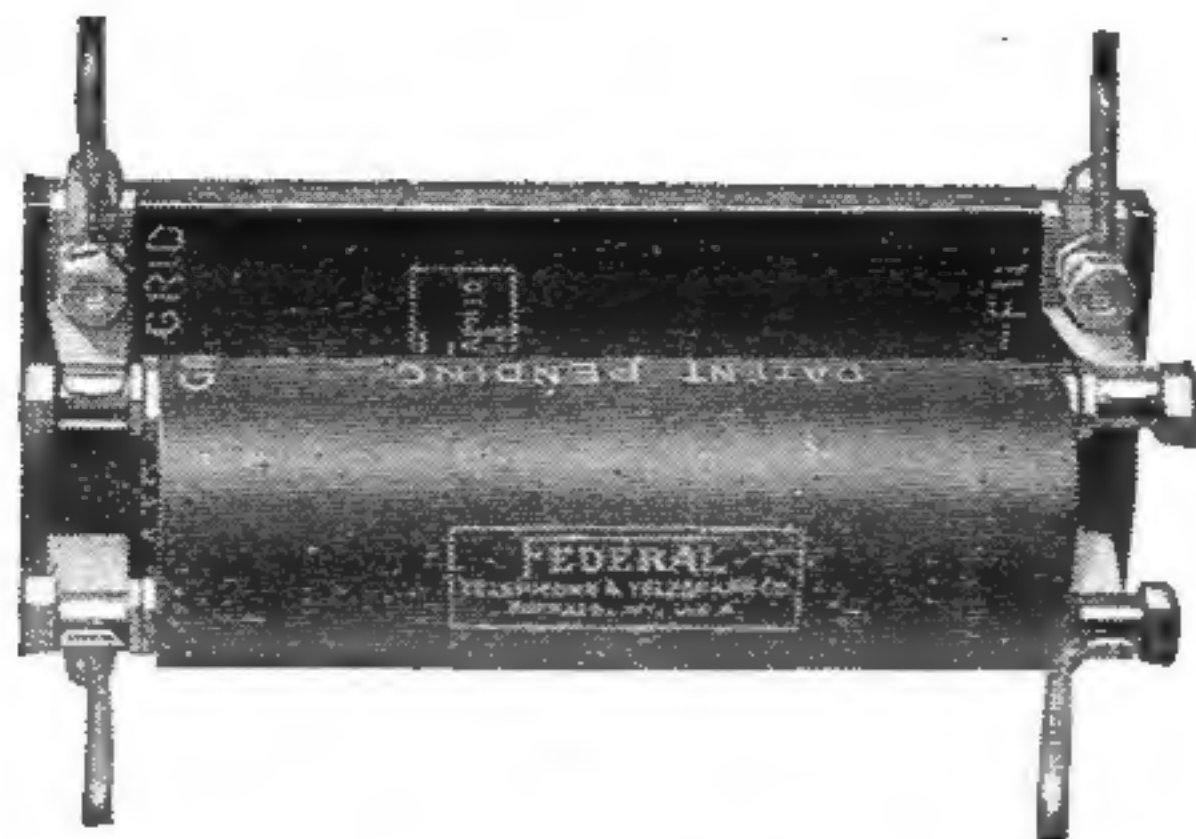
- 1 - To PHONE CONNECTION, DETECTOR
- 2 - To DETECTOR, FIL. CONTROL JACK
- 3 - To 'A' BAT 6 VOLTS
- 4 - To 'B' BAT 40 TO 60 VOLTS
- A - AMPLIFIER TUBES
- R - RHEOSTAT '18
- T - 226-W TRANSFORMER

Federal Telephone & Telegraph Company
Buffalo, New York, U. S. A.

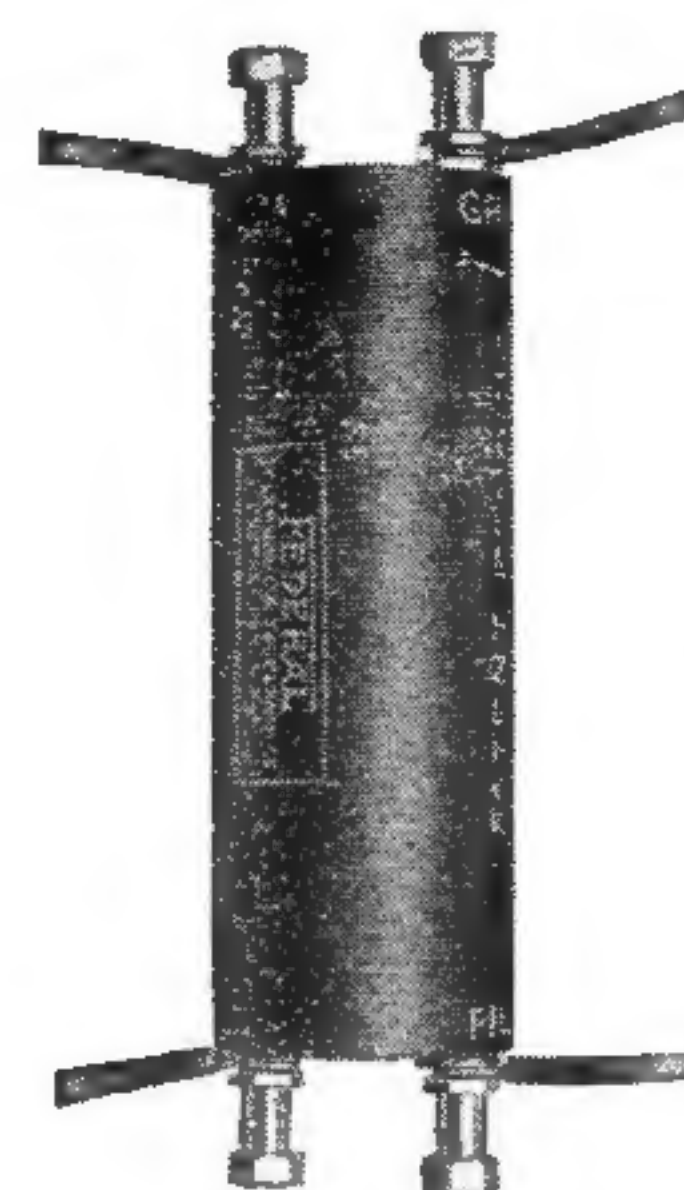
Federal Radio Frequency Amplifying Transformers



Mounting



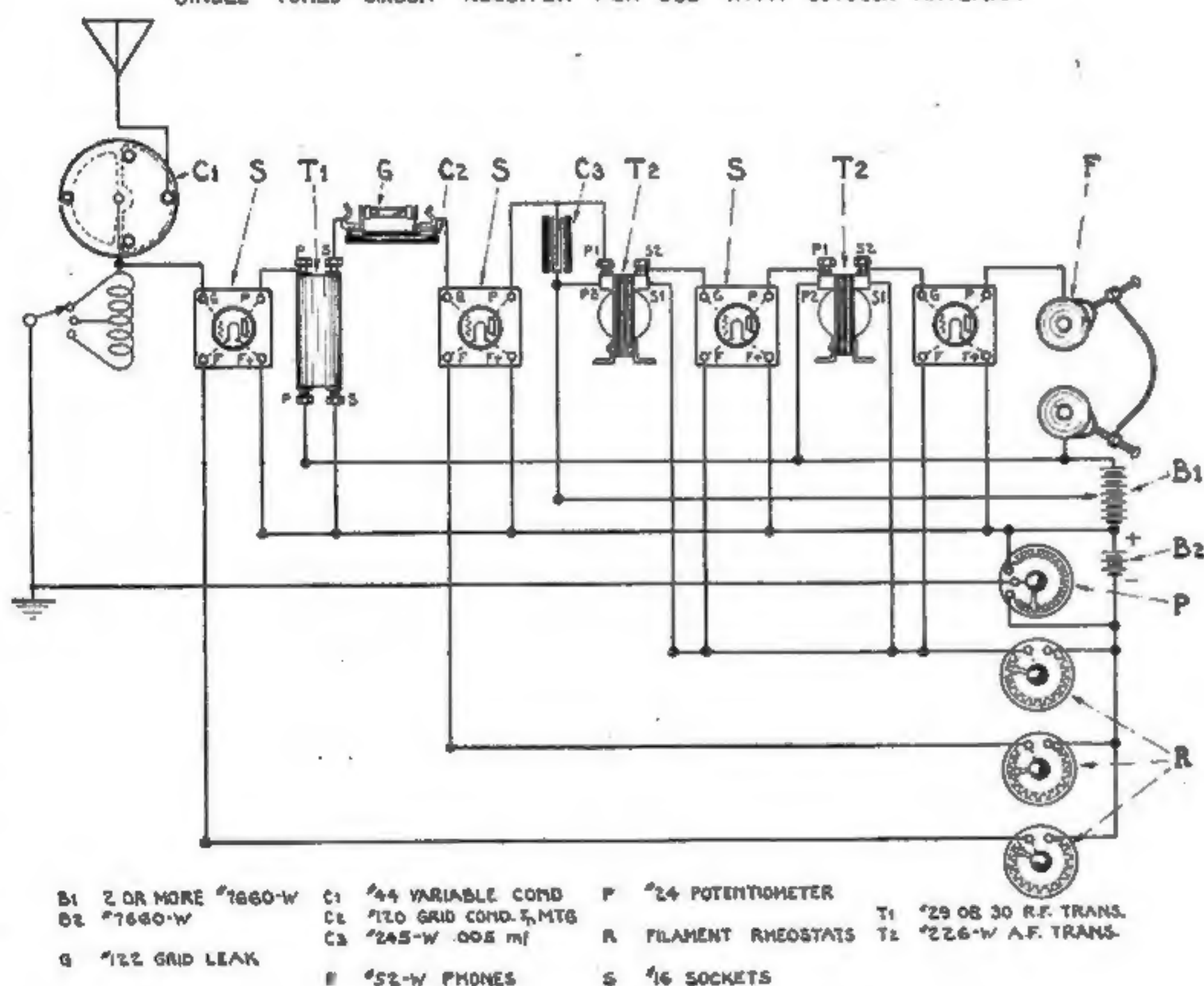
Complete Transformer Unit



Transformer

Federal Radio Frequency Transformers are the result of months of careful painstaking research work, and are a fit companion to the famous Federal No. 226-W Audio Frequency Amplifying Transformers. With the Federal Radio Frequency Amplifying Transformer it has become possible to attain remarkable receiving ranges with a degree of amplification that is almost unbelievably great.

1 STAGE R.F. AMPLIFICATION-DETECTOR-2 STAGES A.F. AMPLIFICATION
SINGLE TUNED CIRCUIT RECEIVER FOR USE WITH OUTDOOR ANTENNA

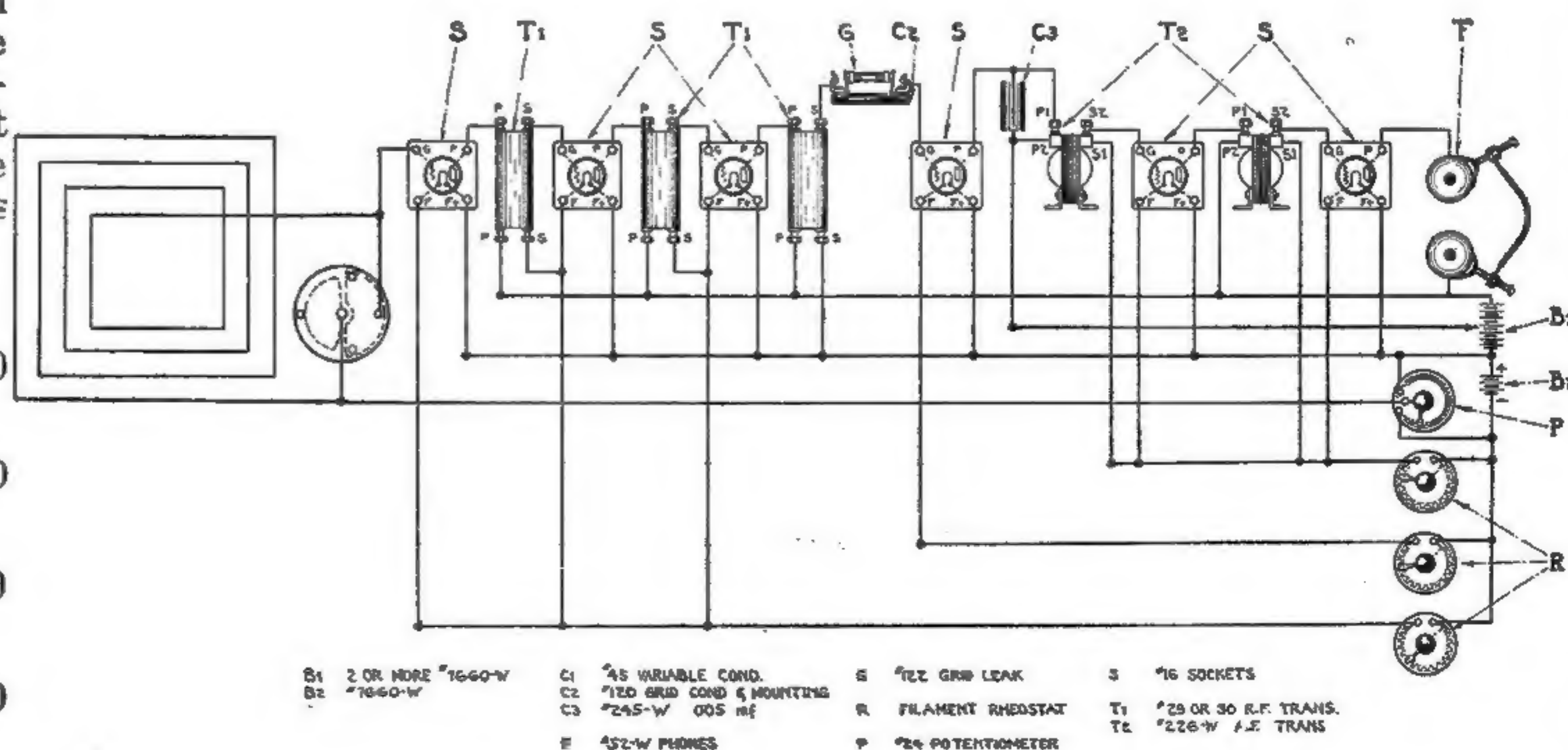


The admirable characteristics of Radio Frequency Amplification augments the amplification available from Audio Frequency Amplification as it does not induce extraneous noises as does the older type of amplification when used in excessive degree. It makes possible the use of the loop antenna for reception and thereby reduces the troublesome effect of static.

Federal Radio Frequency Transformers are designed to give amplification over the definite band of wavelengths as indicated by their wavelength ratings and in these conservatively chosen ratings the transformers give extraordinary amplification.

The Federal Radio Frequency Transformer by actual measurement shows a greater amplification throughout its range than do any other similar devices. Our No. 29 R. F. Transformer is recommended for use between 175 and 300 meters; the No. 30 Transformer may be used for reception on wavelengths between 275 and 600 meters (broadcast), while the No. 31 Transformer may be used on wavelengths between 500 meters and 1000 meters.

3 STAGES R.F. AMPLIFICATION-DETECTOR-2 STAGES A.F. AMPLIFICATION
RECEIVER FOR USE WITH LOOP



Their wavelength ratings as given above are very conservative so that the user may be assured of maximum amplification over the specified ranges, but it will be found quite possible to use these Transformers at wavelengths in excess of those given by their ratings.

No. 29 Transformer—175 to 300 meters	each	5.50
No. 30 Transformer—275 to 600 meters	each	\$5.50
No. 31 Transformer—500 to 1000 meters	each	\$5.70
No. 40 Transformer Mounting only	each	\$.80